Boiler Manual

Incorporating:

Guarantee Registration
User Instructions
Installation Instructions
Service Instructions
Service Record

High Efficiency Condensing Boilers

For use with kerosene only

Models covered by this manual:

U-Series

Utility	*U70HE*	*U90HE*	*U120HE*	*U150HE*
Utility Pumped	*UP70HE*	*UP90HE*	*UP120HE*	*UP150HE*
Utility System	*US70HE*	*US90HE*	*US120HE*	
Utility Combi	*UC70HE*	*UC90HE*		

K-Series

Kabin Pak	*K70HE*	*K90HE*	*K120HE*	*K150HE*
Kabin Pak Pumped	*KP70HE*	*KP90HE*	*KP120HE*	*KP150HE*
Kabin Pak System	*KS70HE*	*KS90HE*	*KS120HE*	
Kabin Pak Combi	*KC70HE*	*KC90HE*		

ISO 9001/2002
CERT No. FM 29884

WARMFLOW
The Boiler People

LEAVE THIS MANUAL WITH THE END USER

ISSUE 3
AUG 08

Commissioning

This appliance must be commissioned. Failure to commission the boiler will invalidate the warranty. After commissioning ensure that the attached guarantee registration card is completed and returned. Alternatively, you can register your guarantee online at www.warmflow.co.uk

Servicing

To ensure continued reliable operation and fuel economy it is recommended that the boiler is serviced annually by a Warmflow or an OFTEC registered technician.

NI Customers Only

Warmflow Engineering Service division (NI) provides an excellent back-up service, operating a team of OFTEC trained engineers who can meet all the servicing, commissioning and breakdown requirements for your appliance.

Telephone: 0870 240 6532
Fax: 028 9262 2827
Email: service@warmflow.co.uk
Web: www.warmflow.co.uk

For Parts, Service Technical & Warranty Contact

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technical@warmflowgb.co.uk
service@warmflowgb.co.uk

This manual is accurate at the date of printing (E&OE) but will be superseded and should be disregarded if specifications and/or appearances are changed in the interests of continued product improvement.

Code 3307

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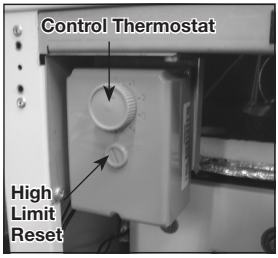
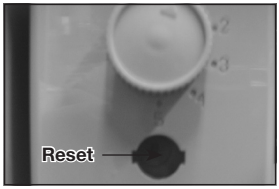
USER INSTRUCTIONS

Dual Thermostat

The radiator temperature is regulated via the boiler control thermostat. The thermostat is user adjustable from 55°C at its minimum setting (dial '0') to 85°C at its maximum setting (dial '5'). In order to provide an additional level of safety there is a high limit thermostat which has a cut off point of 110°C; this is factory set and is not adjustable. If thermostat trips it needs to be reset manually.



High Limit Thermostat Reset

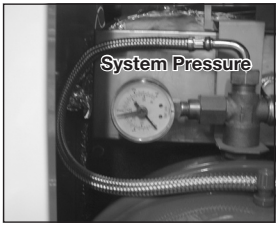


If the high level thermostat trip has operated, remove the reset cover by using a coin or screwdriver (turning anti clockwise) and press the small red button now exposed. Do not press the reset button while the boiler is still hot as this will cause damage to the thermostat.

Burner Lockout

When the pressure jet oil fired burner stops after failing to fire the red reset button will be illuminated. This indicates that there is a fault or there is no fuel getting to the burner. The house holder should only reset the burner twice in succession. If the burner continues to lockout contact Warmflow or your service engineer.

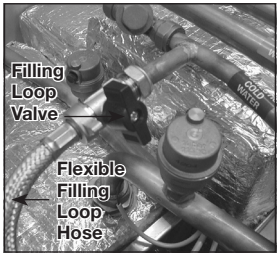
System Pressure – System & Combi Boilers



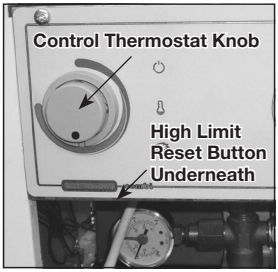
When the boiler is connected to a sealed system the system pressure should be periodically checked. The minimum pressure, as indicated by the black needle, is 0.5 bar when the boiler is cold and 2.5 bar when the boiler is at normal operating temperature. If the pressure is outside this range contact Warmflow or your installer.

Filling Loop

If the system pressure falls below the minimum (eg, removal of radiator for decorating purposes) then the system should be topped up using the filling loop valve. After the system has been topped up the pressure gauge should read 1 bar when the system is cold. The valve must be fully closed and the filling loop flexible removed from the valve, expect a small water loss from the pipe.



Combi Control Panel



The heating control thermostat is user adjustable from 55°C to 85°C. In order to provide an additional level of safety there is a high limit thermostat which has a cut off point of 110°C; this is factory set and is not adjustable. The high limit thermostat is located under the control panel to the left hand side, press button to reset. As standard the panel is fitted with two on/off selector switches to control hot water and central heating. These switches can be replaced by the optional two channel digital programmer, instructions for use are provided in the main boiler handbook.

This boiler must be serviced annually. Contact Warmflow for further details.

In the event of a breakdown please contact your commissioning engineer who should then contact our service department whilst at your home, to report the fault.

CONDENSING BOILER INSTALLATION REQUIREMENTS

The Warmflow condensing boiler can be fitted to most installations using standard practices and techniques.

There are however a number of considerations that must be taken into account.

1. All existing systems must be properly flushed to remove any sediment/ sludge in order to prevent any blockage or reduction in efficiency of the boiler.

2. The system must be fully pumped.

3. The primary difference between an ordinary boiler and a condensing boiler is the condensate drain. The drain can be plumbed from the condensate trap in any ordinary plastic pipe, eg, plastic overflow pipe, directly into the household drain or soak away.

   Any blockage in the drain could lead to an alteration in the combustion settings because of partially blocked flueways.

   Where the boiler is fitted into a basement a condensate pump may be required.

4. As an indicator of the increased efficiency of a condensing boiler there may be a visible plume of ‘steam’ from the flue. Care needs to be exercised when positioning the appliance and selecting the type of flue to ensure that the plume does not cause a nuisance to the householder or to surrounding properties.

   As the water temperature in the system rises the pluming effect will diminish. Even where pluming is not visible the boiler is still operating more efficiently than a standard boiler.

BEFORE FITTING A COMBI BOILER THE INSTALLER MUST CHECK:

1. What the maximum hot water demand placed on the boiler is likely to be. Not every installation is suitable for a Combi boiler. Systems requiring very high hot water flow rates may be better suited with an unvented cylinder.

2. That the mains are capable of supplying up to 24 litre/min with a minimum dynamic pressure of 1.8 bar at the boiler. This is to ensure that the boiler can achieve its maximum output. To protect the appliance and to prevent excessive flow rates, a pressure reducing valve must be fitted to limit the maximum supply pressure to 3 bar.

3. Where the mains water pressure is supplied via a borehole pump and accumulator the pressure variation must not affect the thermostatic mixer valve. Contact Warmflow for further details.

4. The hardness of the mains water supply. Systems with hard water must be fitted with a suitable chemical scale preventer (eg Fernox Quantomat or Combimate).

5. That the flow from any one hot water outlet does not exceed the maximum recommended. This applies particularly to baths which are usually fitted with larger taps and larger bore supply pipes. It may be necessary to restrict the flow to these taps by reducing the bore of the supply pipework (eg 15mm) or by fitting a restrictor into the pipework.

6. That any outlet when opened does not starve all the other outlets of hot water. If more than one outlet is open at the same time then the total flow from all the outlets should not exceed the maximum flow rate of the boiler.

7. That any showers being supplied with hot water by the boiler are compatible with this type of appliance.

   It should be noted that the boiler has been factory fitted with an 18 litre/min flow restrictor.

   The manufacturer's guarantees are void if the appliance is not installed and commissioned in accordance with the recommendations made herein.

1.0 General Information

1.1 Introduction

Note: All our domestic appliances have been independently tested and accredited as exceeding the minimum SEDBUK efficiency levels required for their type, in compliance with the Building Regulations Approved Document L1A, L1B for England and Wales, the Building Standards (Scotland) Regulations Section 6, Part F Northern Ireland and Part L Republic of Ireland.

Warmflow oil fired condensing boilers are designed to burn Class C2 (28 sec redwood) kerosene only and to be used on a fully pumped system, and are suitable for connection to sealed heating systems.

As standard the Combi and System boilers are fitted with a system expansion vessel, circulating pumps, filling loop, pressure gauge and safety valve. An optional 7-day electronic programmer kit is also available for all Utility boiler models.

The Combi can provide at mains pressure domestic hot water without the need for a storage cylinder.

The manufacturer's guarantees are void if the appliance is not installed and commissioned in accordance with the recommendations made herein.

1.2 General Requirements

The installation of the boiler must be in accordance with the following regulations.

BS5410 : PART 1 Code of practice for oil firing.
BS5449 : PART 1 Forced circulation hot water systems.
BS7593 : Treatment of water in domestic hot water central heating systems.

Current Building Regulations:	Part J England and Wales
	Section 3 Scotland
	Part L Northern Ireland
	Part J Republic of Ireland

Current IEE Regulations

BS7074 : PART 1 Application Selection & Installation of Expansion Vessels

The heating system should be installed by a competent installer in accordance with the recommendations laid down by HVCA, OFTEC and sound engineering practice.

In order to comply with building regulations OFTEC forms CD10 for installations and CD11 for commissioning should be left with the customer. Alternatively the installation can be inspected and approved by a building control officer. CD10 and CD11 forms are available from OFTEC on Tel: 0845 658 5080, Fax: 0845 658 5181.

1.3 Combi General Requirements

The boiler will have a DHW priority when both domestic hot water (DHW) and central heating (CH) are selected. So if the flow switch is closed or the heat store has not been satisfied the entire output of the boiler is directed to DHW before the boiler will switch over to CH. When fully cold it can take up to 20 minutes for the heat store of a 90,000 Btu/h combi to be satisfied, and slightly longer for a 70,000 Btu/h combi.

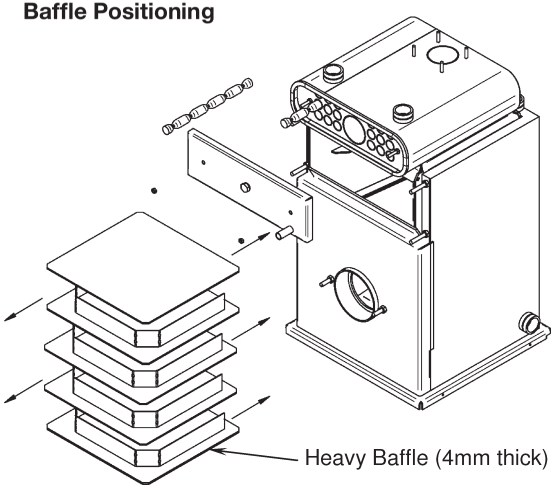
After a draw-off of 120L at 24L/min, with an average temperature rise of 32ºC, the thermal store of a 90,000 Btu/h combi has a recovery time of approximately 7 minutes. A 70,000 Btu/h combi will take slightly longer to recover.

Note: If HW has not been selected no hot water can be produced even if the heat store is up to temperature.

1.3.1 Pump Overrun

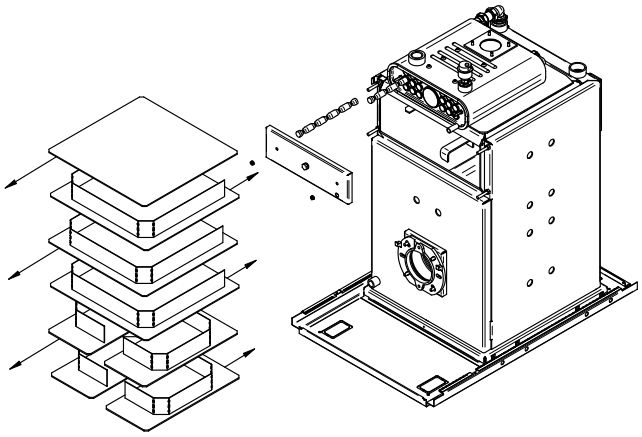
Where there is a build up of excess heat in the boiler primary heat exchanger and the central heating has not been selected then the pump overrun thermostat will operate. The excess heat will then be pumped into the heat store. Once the temperature has fallen in the boiler and the pump overrun stat is satisfied, then the hot water pump will stop.

1.4 Baffle Positioning



Models up to 120 HE

The primary heat exchanger baffles consist of one heavy baffle stack (4mm thick) at the bottom, 3 lighter baffle stacks (3mm thick) in the middle and 1 baffle plate (3mm thick) at the top. Upon installation or after servicing, ensure the baffles are in the correct order and correctly stacked. To achieve maximum efficiency push the primary heat exchanger baffles in the direction of the arrows as shown. The secondary heat exchanger spring baffles must be fully inserted into the heat exchanger tubes (narrow end first).



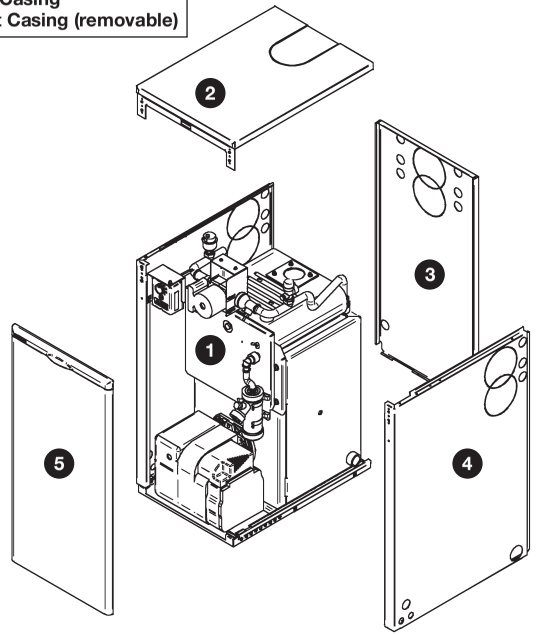
150 HE Models

The primary heat exchanger baffles consist of two half-width baffle stacks at the bottom, 3 full-width baffle stacks in the middle and 1 baffle plate at the top. Upon installation or after servicing, ensure the baffles are in the correct order and correctly stacked. To achieve maximum efficiency, push the primary heat exchanger baffles in the direction of the arrows as shown. The secondary heat exchanger spring baffles must be fully inserted into the heat exchanger tubes (narrow end first).

1.5 Components

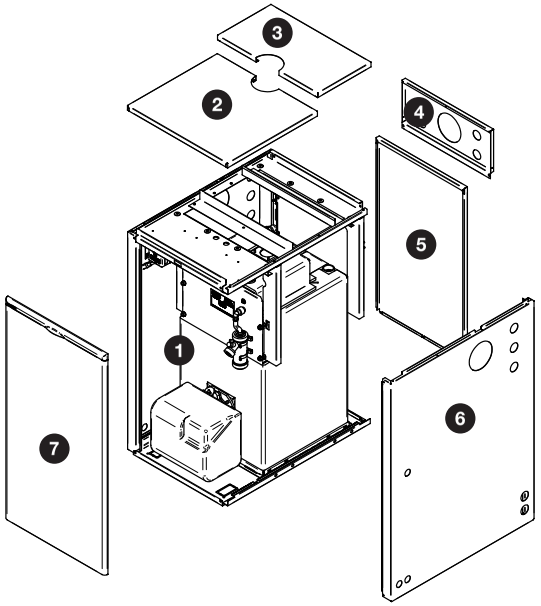
1.5.1 U-Series Utility – Casing Components

1. Boiler Assembly
2. Top Casing (removable)
3. Rear Casing
4. Side Casing
5. Front Casing (removable)



Models up to 120 HE

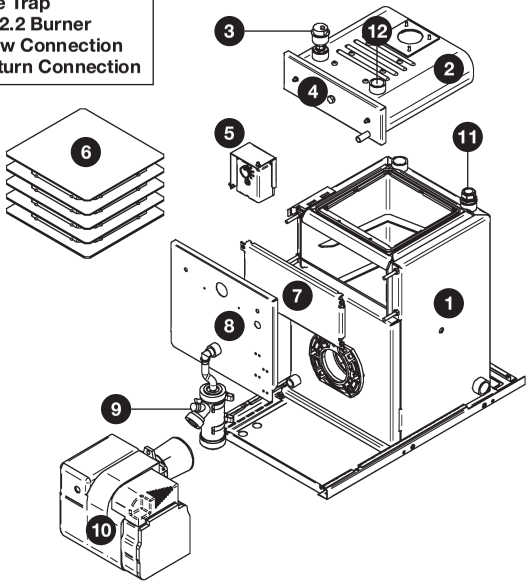
1. Boiler Assembly
2. Top Front Casing (removable)
3. Top Rear Casing (removable)
4. Rear Flue Casing
5. Rear Casing (removable)
6. Side Casing
7. Front Casing (removable)



150 HE Models

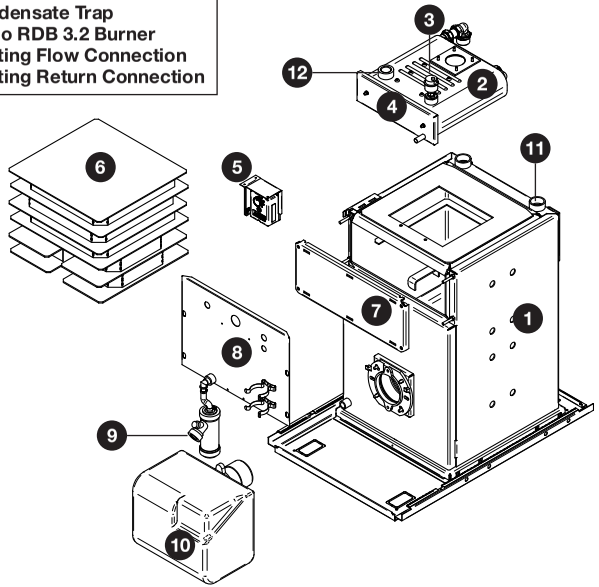
1.5.2 U-Series Utility – Pre-Wired (UHE) – Key Components

1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection



Models up to 120 HE

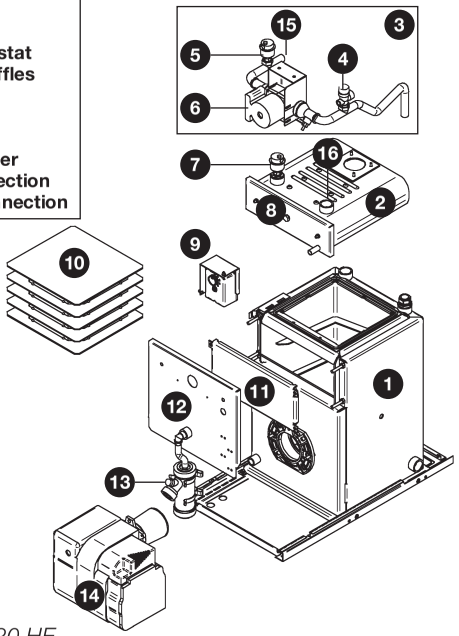
1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 3.2 Burner
11. Heating Flow Connection
12. Heating Return Connection



150 HE Models

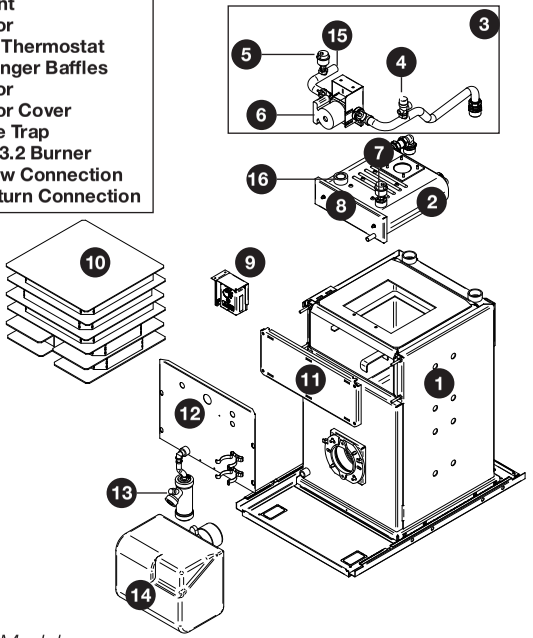
1.5.3 U-Series Utility – Pumped (UPHE) – Key Components

1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 2.2 Burner
15. Heating Flow Connection
16. Heating Return Connection



Models up to 120 HE

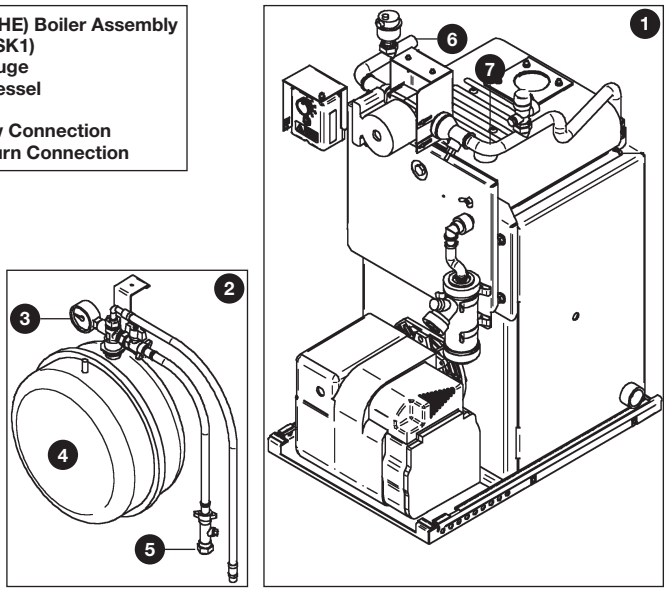
1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 3.2 Burner
15. Heating Flow Connection
16. Heating Return Connection



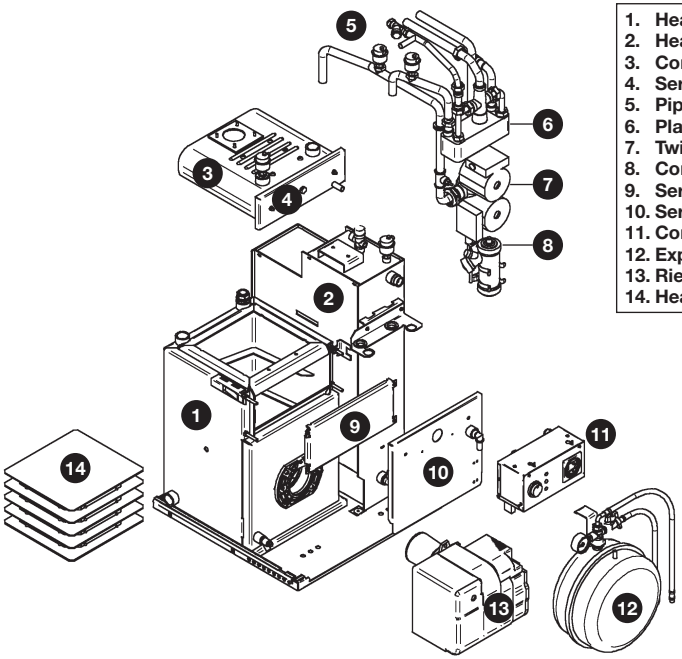
150 HE Models

1.5.4 U-Series Utility – System (USHE) – Key Components

1. Pumped (UPHE) Boiler Assembly
2. System Kit (SK1)
3. Pressure Gauge
4. Expansion Vessel
5. Filling Loop
6. Heating Flow Connection
7. Heating Return Connection



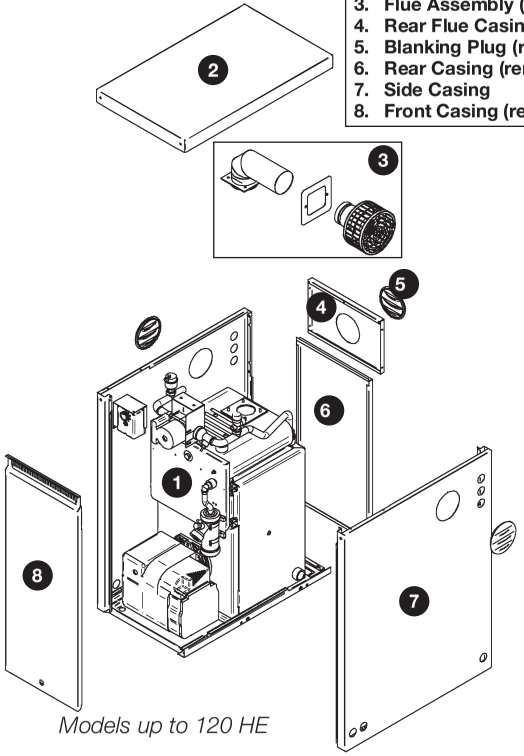
1.5.5 U-Series Utility – Combi (UCHE) – Key Components



1. Heat Exchanger
2. Heat Store
3. Condensing Unit
4. Service Door
5. Pipework Assembly
6. Plate Heat Exchanger
7. Twin Head Pump
8. Condensate Trap
9. Service Door
10. Service Door Cover
11. Control Panel
12. Expansion Vessel
13. Riello RDB 2.2 Burner
14. Heat Exchanger Baffles

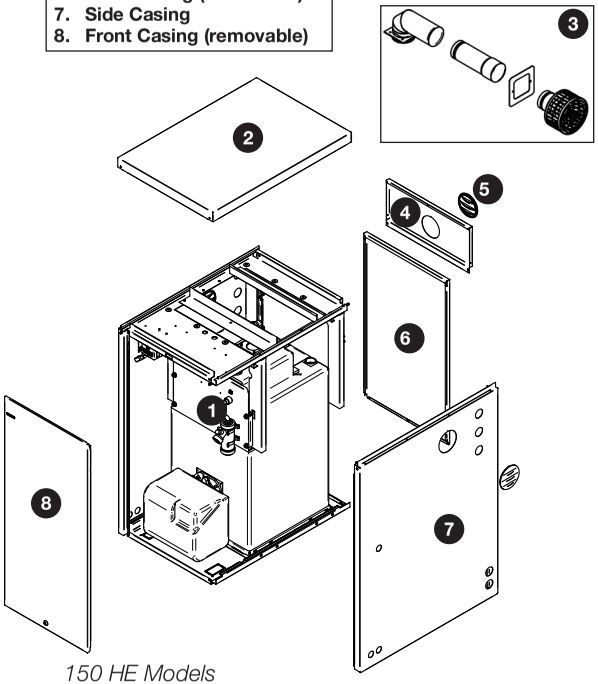
1.5.6 K-Series Kabin Pak – Casing Components

1. Boiler Assembly
2. Top Casing (removable)
3. Flue Assembly (removable)
4. Rear Flue Casing
5. Blanking Plug (removable)
6. Rear Casing (removable)
7. Side Casing
8. Front Casing (removable)



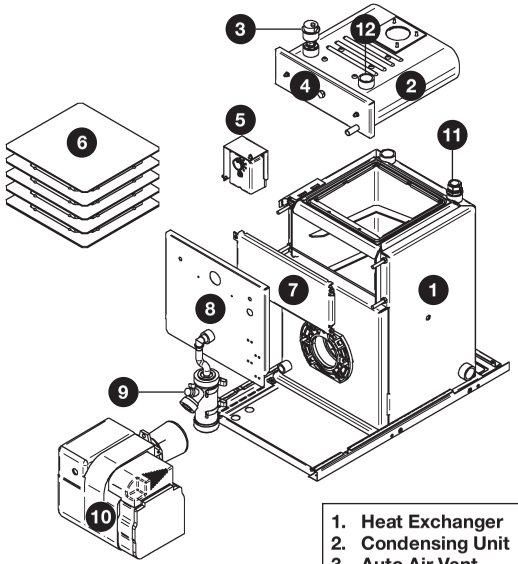
Models up to 120 HE

1. Boiler Assembly
2. Top Casing (removable)
3. Flue Assembly (removable)
4. Rear Flue Casing
5. Blanking Plug (removable)
6. Rear Casing (removable)
7. Side Casing
8. Front Casing (removable)



150 HE Models

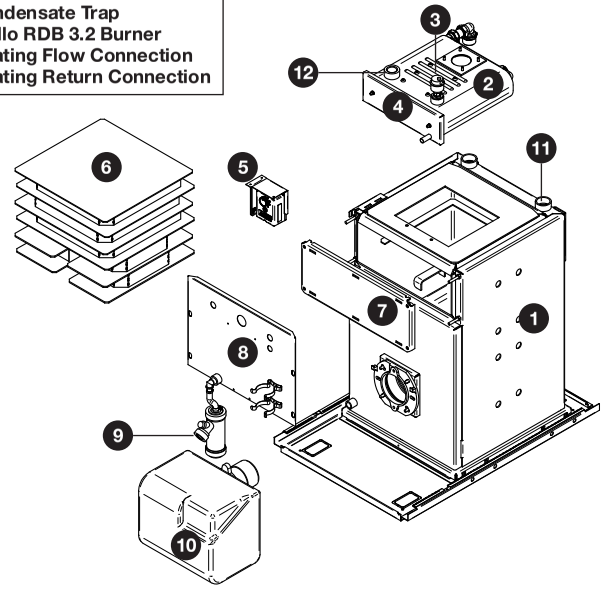
1.5.7 K-Series Kabin Pak – Pre-Wired (KHE) – Key Components



1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 2.2 Burner
11. Heating Flow Connection
12. Heating Return Connection

Models up to 120 HE

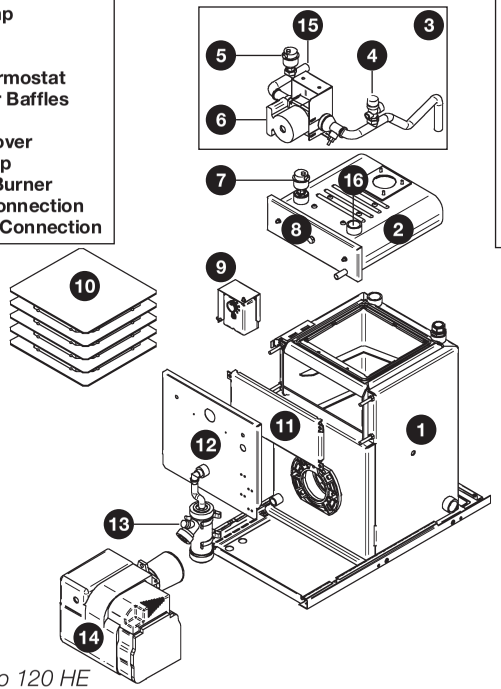
1. Heat Exchanger
2. Condensing Unit
3. Auto Air Vent
4. Service Door
5. 'Dual-Safe' Thermostat
6. Heat Exchanger Baffles
7. Service Door
8. Service Door Cover
9. Condensate Trap
10. Riello RDB 3.2 Burner
11. Heating Flow Connection
12. Heating Return Connection



150 HE Models

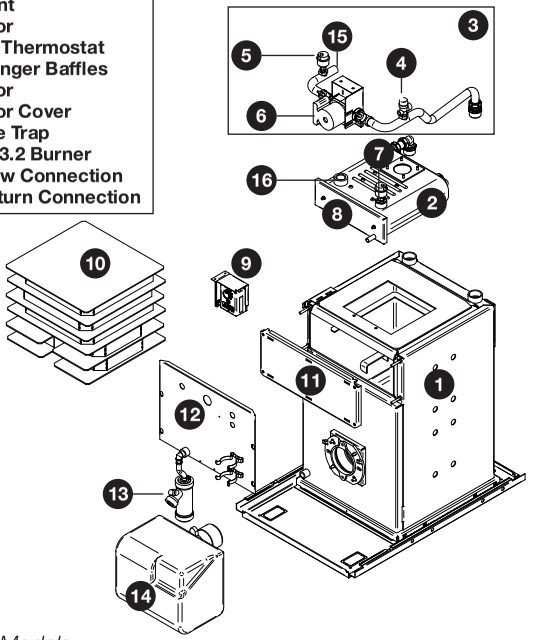
1.5.8 K-Series Kabin Pak – Pumped (KPHE) – Key Components

1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 2.2 Burner
15. Heating Flow Connection
16. Heating Return Connection



Models up to 120 HE

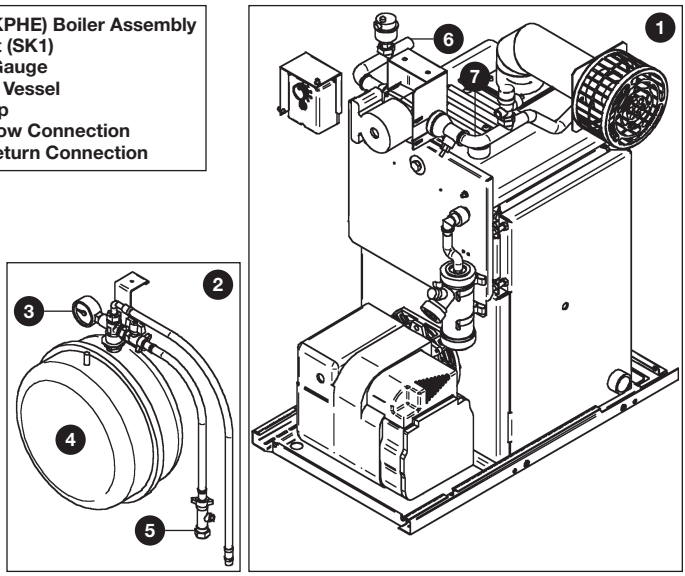
1. Heat Exchanger
2. Condensing Unit
3. Pipework Assembly
4. Pressure Relief Valve
5. Auto Air Vent
6. Circulating Pump
7. Auto Air Vent
8. Service Door
9. 'Dual-Safe' Thermostat
10. Heat Exchanger Baffles
11. Service Door
12. Service Door Cover
13. Condensate Trap
14. Riello RDB 3.2 Burner
15. Heating Flow Connection
16. Heating Return Connection



150 HE Models

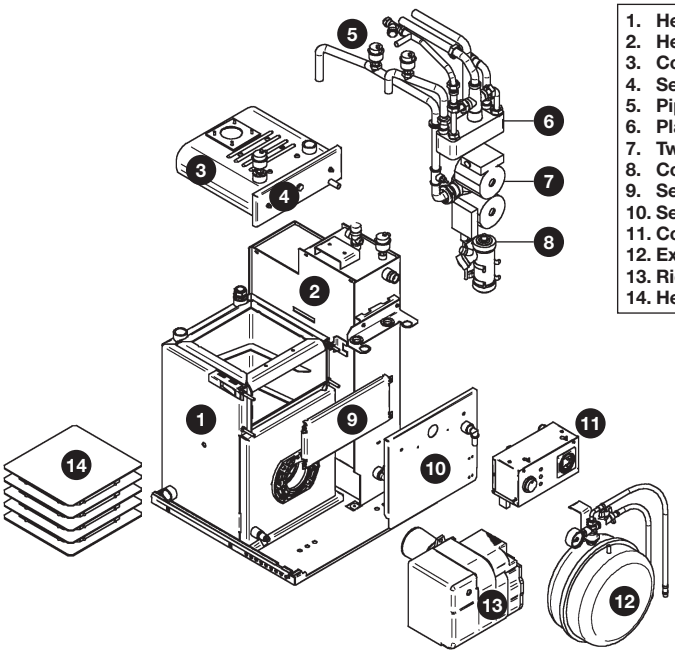
1.5.9 K-Series Kabin Pak – System (KSHE) – Key Components

1. Pumped (KPHE) Boiler Assembly
2. System Kit (SK1)
3. Pressure Gauge
4. Expansion Vessel
5. Filling Loop
6. Heating Flow Connection
7. Heating Return Connection

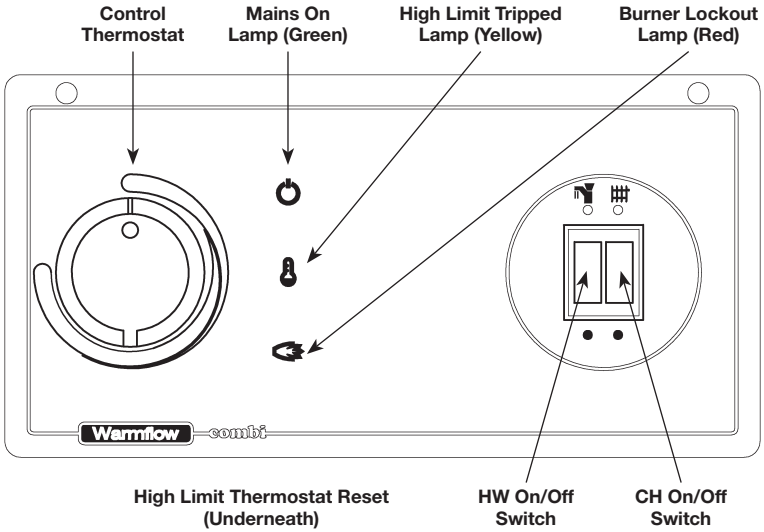


1.5.10 K-Series Kabin Pak – Combi (KCHE) – Key Components

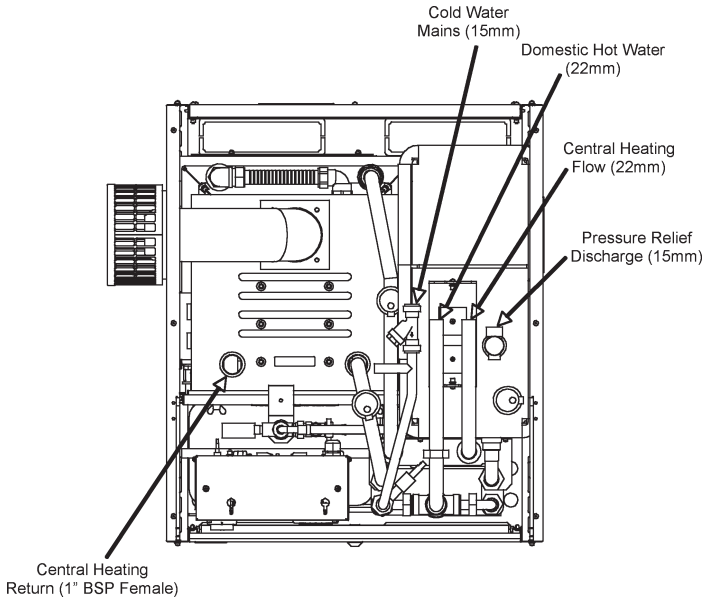
1. Heat Exchanger
2. Heat Store
3. Condensing Unit
4. Service Door
5. Pipework Assembly
6. Plate Heat Exchanger
7. Twin Head Pump
8. Condensate Trap
9. Service Door
10. Service Door Cover
11. Control Panel
12. Expansion Vessel
13. Riello RDB 2.2 Burner
14. Heat Exchanger Baffles



1.5.11 Combi Control Panel Layout

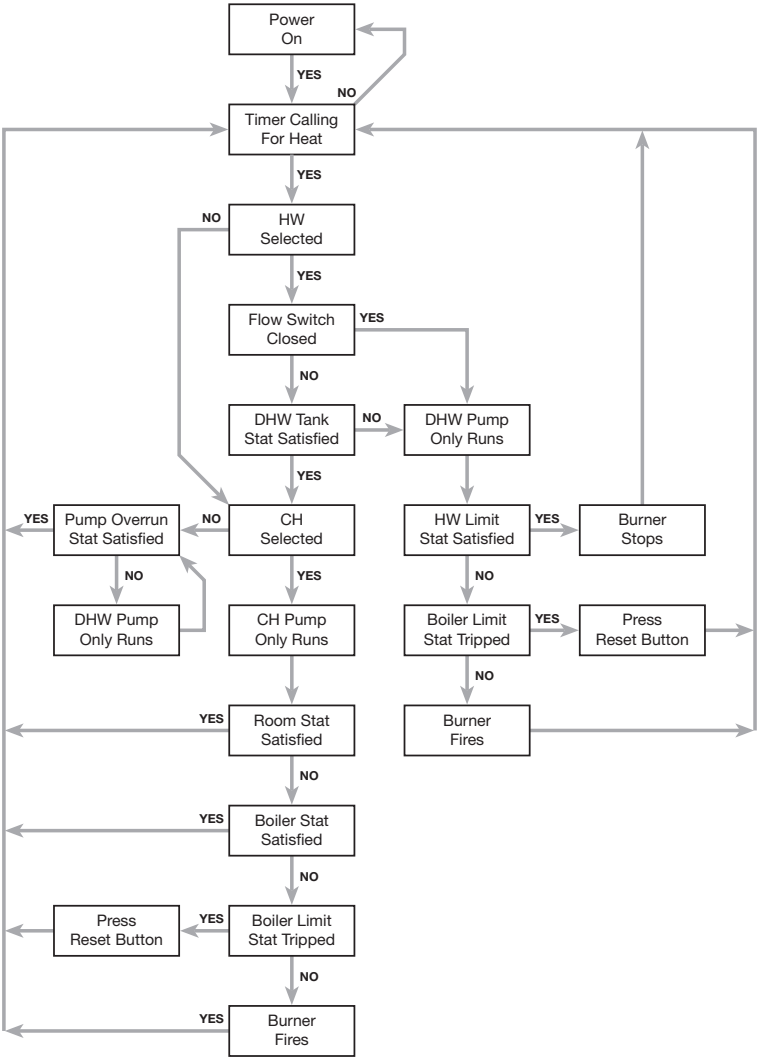


1.5.12 Combi Pipe Layout (UCHE & KCHE Models)


Cold Water Mains (15mm)
Domestic Hot Water (22mm)
Central Heating Flow (22mm)
Pressure Relief Discharge (15mm)
Central Heating Return (1" BSP Female)

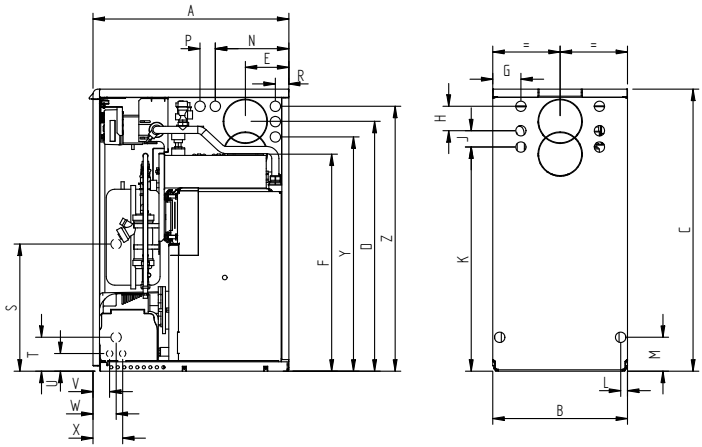
2.0 Technical Details

2.1 Combi Sequence of Operation Flow Chart



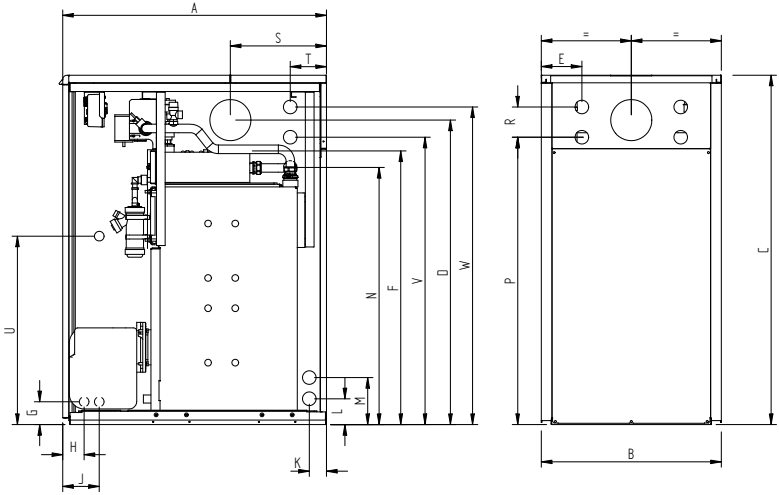
2.2 Dimensions

2.2.1 U-Series Utility (UHE, UPHE & USHE Models up to 120HE)



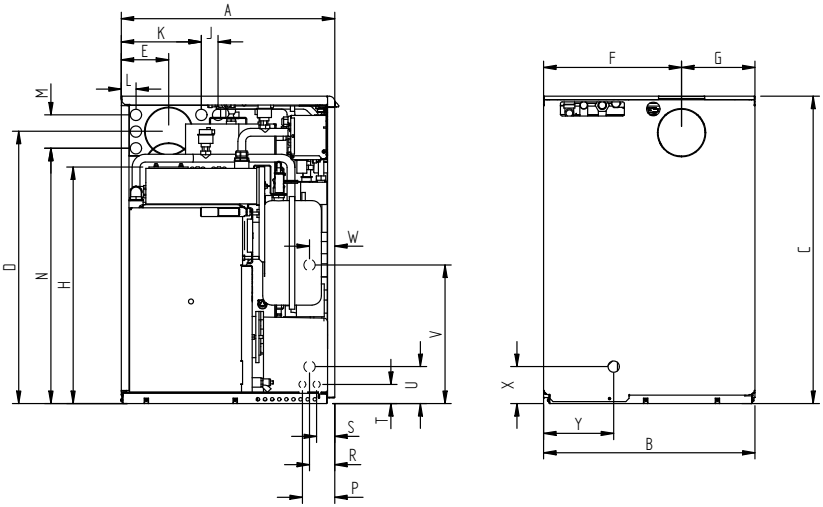
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z
U~	600	413	865	766	134	666	86	75	50	687	21	104	226	47	41	390	104	54	51	71	91	718	812
UP~	600	413	865	766	134	666	86	75	50	687	21	104	226	47	41	390	104	54	51	71	91	718	812
US~	600	413	865	766	134	666	86	75	50	687	21	104	226	47	41	390	104	54	51	71	91	718	812

2.2.2 U-Series Utility (150 HE Models)



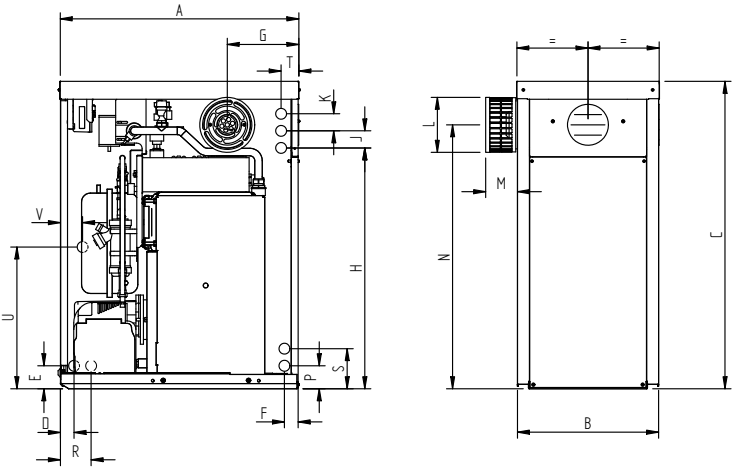
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W
U150HE	872	595	1155	1007	134	905	75	71	121	57	85	155	850	950	100	318	120	623	950	1050
UP150HE	872	595	1155	1007	134	905	75	71	121	57	85	155	850	950	100	318	120	623	950	1050

2.2.3 U-Series Utility (UCHE Models)



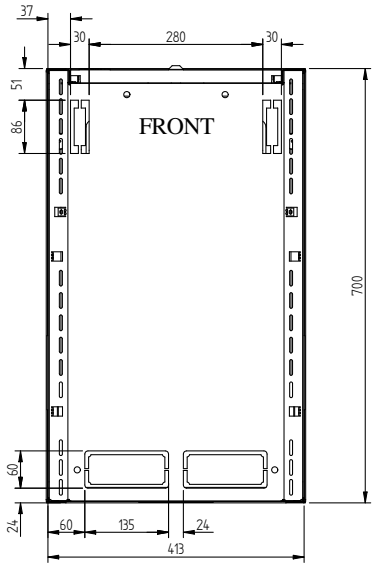
MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X	Y
UC~	600	595	865	766	134	388	207	666	47	226	42	94	718	91	71	51	54	104	390	71	104	197

2.2.4 K-Series Kabin Pak (KHE, KPHE & KSHE Models up to 120HE)

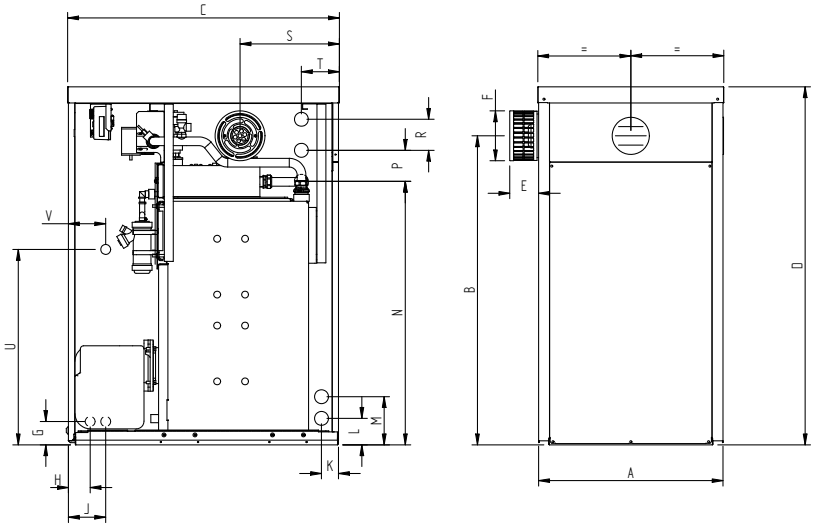


MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
K~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65
KP~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65
KS~	700	413	900	40	67	40	210	705	50	50	161	93	773	67	90	117	52	415	65

2.2.5 K-Series Kabin Pak Base Tray (KHE, KPHE & KSHE Models up to 120HE)

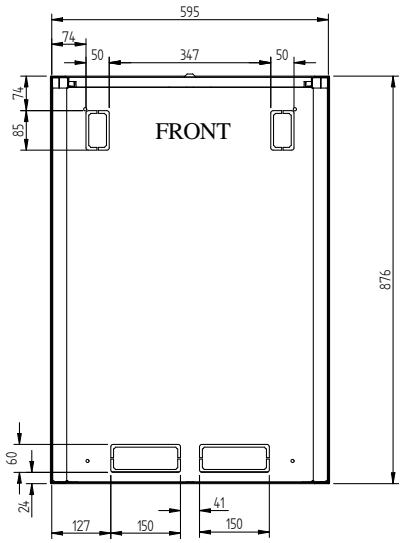


2.2.6 K-Series Kabin Pak (150HE Models)

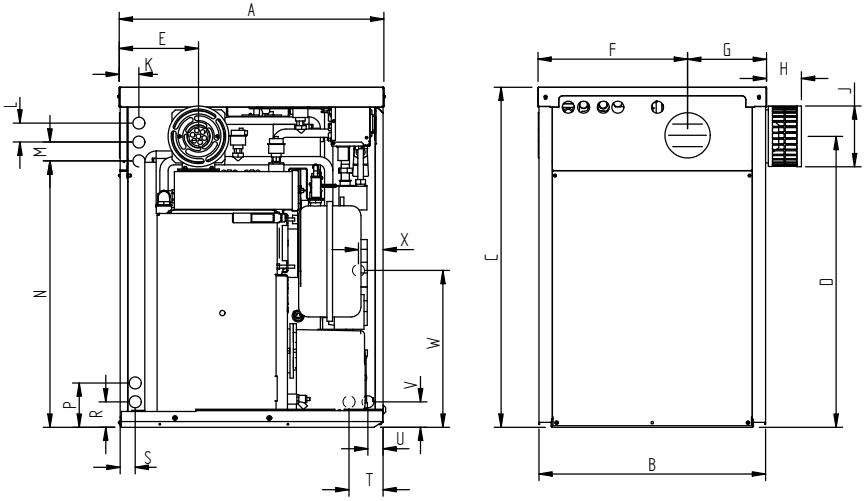


MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
K150HE	595	997	876	1155	93	161	75	70	120	55	85	155	850	100	100	320	122	630	120
KP150HE	595	997	876	1155	93	161	75	70	120	55	85	155	850	100	100	320	122	630	120

2.2.7 K-Series Kabin Pak Base Tray (150HE Models)

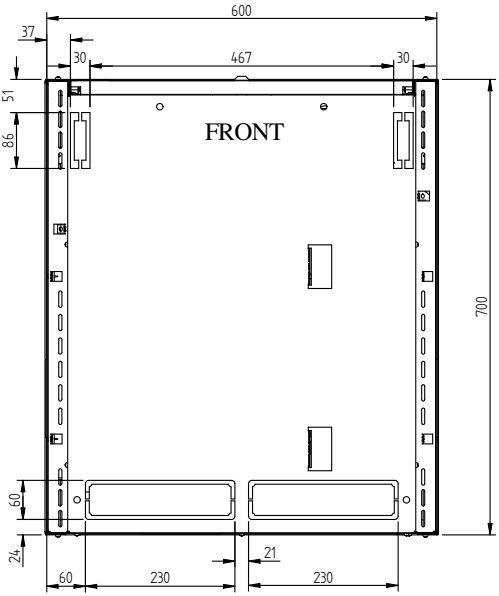


2.2.8 K-Series Kabin Pak (KCHE Models)



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	X
KC~	700	600	900	770	210	396	209	92	161	52	50	50	705	117	67	40	90	40	67	415	65

2.2.9 K-Series Kabin Pak Base Tray (KCHE Models)



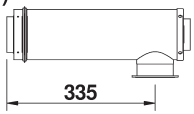
2.3 Flue Options, Components & Dimensions

The use of any flue system other than that supplied or recommended by the manufacturer will invalidate the warranty.

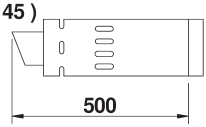
2.3.1 HE Low Level Balanced Flue Kit (FBF)

Comprising the following four main components.

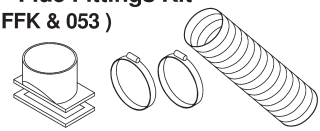
F1 - Horizontal Flue Adapter
(Code 3144)



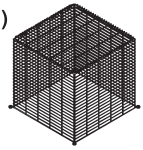
F2 - Horizontal End Terminal
(Code 3145)



F13 - Flue Fittings Kit
(Code FFK & 053)

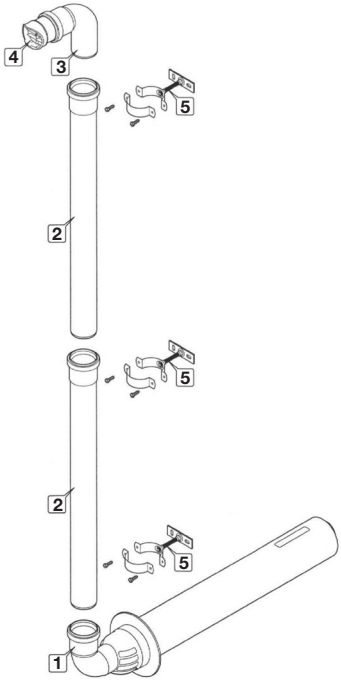


F14 - Terminal Guard
(Code 2234)



2.3.2 Plume Management Kit

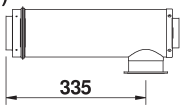
Plume Management Kits are available for our range of appliances. Please refer to the Installation Instructions supplied with the kits.



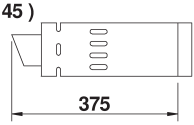
1. **Diverter Assembly**
2. **Extension**
3. **Elbow**
4. **Terminal End**
5. **Mounting Brackets**

2.3.3 Warmflow HE Boiler Flue Components: 80/125 Ø

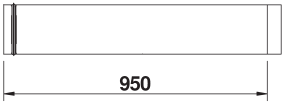
F1 - Horizontal Flue Adapter
(Code 3144)



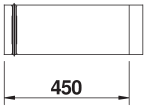
F2 - Horizontal End Terminal
(Code 3145)



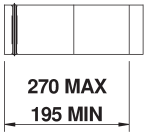
F3 - 1000 mm Extension Pipe
(Code 3146)



F4 - 500 mm Extension Pipe
(Code 3147)

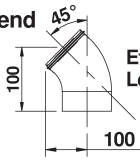


F5 - Telescopic Extension Pipe
(Code 3148)



F6 - Vertical Flue Adapter
(Code 3149)

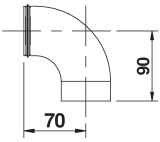
F7 - 45° Bend
(Code 3150)



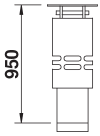
Effective
Length = 0.5 m

F8 - 90° Bend
(Code 3151)

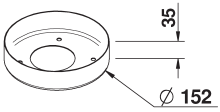
Effective
Length = 1.0 m



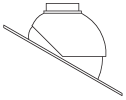
F9 - Vertical End Terminal
(Code 3152)



F10 - Conventional Flue Adapter
(Code 3126)



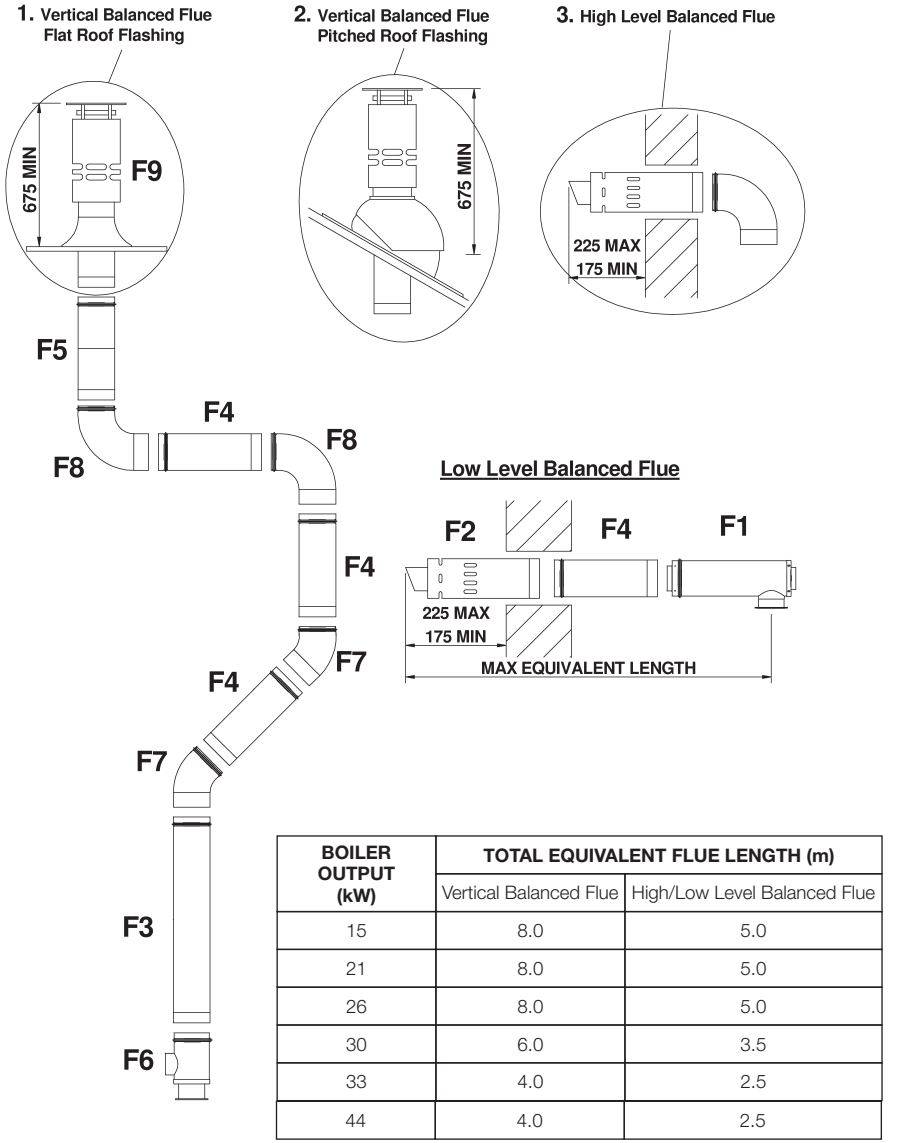
F11 - Pitched Roof Flashing
(Code 2843)



F12 - Flat Roof Flashing
(Code 2842)

Note:
1. **Flue fitting kit required.**
2. **If terminal is less than 2 metres above ground level terminal guard must be fitted.**
3. **Extension pipes and flue adaptor lengths quoted are effective lengths and not the actual length of the piece.**
4. **All dimensions in mm unless otherwise stated.**

2.3.4 Vertical & High Level Terminal Options



BOILER OUTPUT (kW)	TOTAL EQUIVALENT FLUE LENGTH (m)	
	Vertical Balanced Flue	High/Low Level Balanced Flue
15	8.0	5.0
21	8.0	5.0
26	8.0	5.0
30	6.0	3.5
33	4.0	2.5
44	4.0	2.5

Note:

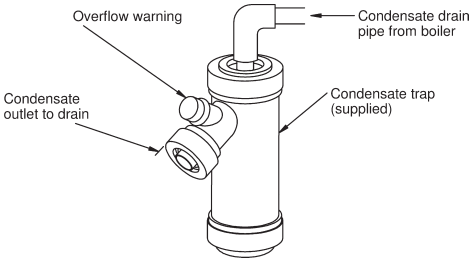
1. **All flues can utilise any combination of bends, straights, adaptors and terminals.**
2. **Ensure flue is arranged such that it falls continuously towards the boiler.**
3. **The Low Level, High Level and Vertical Balanced Flue Systems can use any combination of flue extension pieces up to the maximum equivalent length depending upon boiler output as illustrated in the above table.**

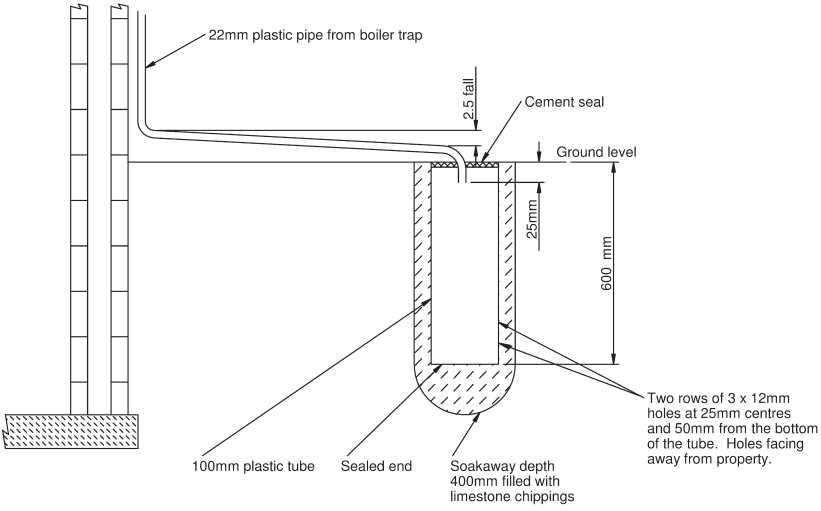
2.4 Condensate Disposal

The Warmflow high efficiency condensing boiler is supplied with a factory fitted, self sealing condensate trap. The trap has been fitted inside the boiler casing to the right hand side.

The condensate drainage pipe within the boiler is a flexible plastic hose which can be trimmed to length. $^{3}/_{4}$" or 22mm pipe should be connected to the flexible hose. The pipe should not be made from steel or copper. The drainage pipe may run into an internal soil stack or waste pipe, an external gulley, hopper or soakaway as shown below.

The boiler when fully condensing will produce a maximum of 1.5 litres per hour of condensate. It is recommended that the drainage pipe should have a minimum fall of 1:20.




22mm plastic pipe from boiler trap
2.5 fall
Cement seal
Ground level
25mm
600 mm
Two rows of 3 x 12mm holes at 25mm centres and 50mm from the bottom of the tube. Holes facing away from property.
100mm plastic tube
Sealed end
Soakaway depth 400mm filled with limestone chippings

2.5 Technical Data

2.5.1 U-Series Utility – Pre-Wired (UHE)

MODEL		U70HE			U90HE			U120HE			U150HE		
Nominal	kW	14.7	**17.6**	21	21	**23.5**	27.1	27.1	**29**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22	22	**24.4**	28	28	**30**	34	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head		T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper		B			N/A			N/A			N/A		
Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp	°C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings													
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry	kg	90			90			90			175		
Boiler Weight Wet		112			112			112			220		
SEDBUK Efficiency	%	92.2			92.8			92.4			91.9		
Factory Settings		Highlighted in Bold											

2.5.2 U-Series Utility – Pumped (UPHE)

MODEL	UP70HE			UP90HE			UP120HE			UP150HE		
Nominal kW	14.7	**17.6**	21	21	**23.5**	27.1	27.1	**29**	32.7	33	**38.5**	44
Heat Output Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal kW	15.3	**18.4**	22	22	**24.4**	28	28	**30**	34	33	**40**	46.8
Heat Input Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner	RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head	T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper	B			N/A			N/A			N/A		
Flue mm Diameter in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp °C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke Bacarach	0			0			0			0		
Kerosene Settings												
Nozzle make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2 %	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection	22mm Copper			22mm Copper			28mm Compression			28mm copper		
Return Connection	1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water litres Content gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry kg	95			95			95			185		
Boiler Weight Wet kg	117			117			117			230		
SEDBUK Efficiency %	92.2			92.8			92.4			91.9		
Factory Settings	Highlighted in Bold											

2.5.3 U-Series Utility – System (USHE)

MODEL		US70HE			US90HE			US120HE		
Nominal	kW	14.7	**17.6**	21	21	**23.5**	27.1	27.1	**29**	32.7
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,380	**99,050**	111,600
Nominal	kW	15.3	**18.4**	22	22	**24.4**	28	28	**30**	34
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head		T1SH			T2SH			T5S		
Secondary Air Damper		B			N/A			N/A		
Flue	mm	100 or 125			100 or 125			100 or 125		
Diameter	in	4 or 5			4 or 5			4 or 5		
Flue Gas Temp	°C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke	Bacarach	0			0			0		
Kerosene Settings										
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate	gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Flow Connection		22mm Copper			22mm Copper			28mm Compression		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female		
Water	litres	22			22			22		
Content	gals	4.8			4.8			4.8		
Boiler Weight Dry	kg	105			105			105		
Boiler Weight Wet	kg	127			127			127		
SEDBUK Efficiency	%	92.2			92.8			92.4		
Factory Settings		Highlighted in Bold								

2.5.4 U-Series Utility – Combi (UCHE)

MODEL		UC70HE			UC90HE		
Nominal Heat Output	kW Btu/hr	14.7 50,000	**17.6** **60,000**	21 71,650	21 71,650	**23.5** **80,000**	27.1 92,380
Nominal Heat Input	kW Btu/hr	15.3 52,150	**18.4** **62,600**	22 75,000	22 75,000	**24.4** **83,175**	28 95,550
Burner		RDB 2.2 15-21			RDB 2.2 21-26		
Head		T1SH			T2SH		
Secondary Air Damper		B			N/A		
Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp	°C	86	**88**	90	90	**93**	95
Smoke	Bacarach	0			0		
Kerosene Settings							
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75
Oil Pump Pressure	bar psi	7.0 102	**9.0** **130**	8.0 116	8.0 116	**8.0** **116**	7.0 102
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel Flow Rate	litres/h gals/h	1.65 0.36	**1.98** **0.44**	2.35 0.52	2.35 0.52	**2.65** **0.58**	2.98 0.65
Water Content	litres gals	74 16.3			74 16.3		
Boiler Weight Dry	kg	140			140		
Boiler Weight Wet	kg	214			214		
Domestic Hot Water (DHW) Production							
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar psi	1.8 26			1.8 26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m gals/m	18 4.0			24 5.3		
Factory Set DHW Flow Rate	litres/m gals/m	18 4.0			18 4.0		
Minimum DHW Flow Rate	litres/m gals/m	2.5 0.55			2.5 0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar psi	3 43.5			3 43.5		
Cold Water Mains Inlet Connection		Minimum 15mm Unrestricted			Minimum 15mm Unrestricted		
DHW Outlet Connection		22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper		
Return Connection		22mm Copper			22mm Copper		
SEDBUK Efficiency	%	90.0			90.0		
Factory Settings		Highlighted in Bold					

2.5.5 K-Series Kabin Pak – Pre-Wired (KHE)

MODEL		K70HE			K90HE			K120HE			K150HE		
Nominal	kW	14.7	**17.6**	21	21	**23.5**	27.1	27.1	**29**	32.7	33	**38.5**	44
Heat Output	Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal	kW	15.3	**18.4**	22	22	**24.4**	28	28	**30**	34	33	**40**	46.8
Heat Input	Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner		RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head		T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper		B			N/A			N/A			N/A		
Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp	°C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke	Bacarach	0			0			0			0		
Kerosene Settings													
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump	bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure	psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel	litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate	gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection		28mm Compression			28mm Compression			28mm Compression			1¼" BSP Female		
Return Connection		1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water Content	litres gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry	kg	90			90			90			175		
Boiler Weight Wet	kg	112			112			112			220		
SEDBUK Efficiency	%	92.2			92.8			92.4			91.9		
Factory Settings		Highlighted in Bold											

2.5.6 K-Series Kabin Pak – Pumped (KPHE)

MODEL	KP70HE			KP90HE			KP120HE			KP150HE		
Nominal kW	14.7	**17.6**	21	21	**23.5**	27.1	27.1	**29**	32.7	33	**38.5**	44
Heat Output Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,380	**99,050**	111,600	112,629	**131,362**	150,128
Nominal kW	15.3	**18.4**	22	22	**24.4**	28	28	**30**	34	33	**40**	46.8
Heat Input Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000	112,629	**136,139**	159,681
Burner	RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33			RDB 3.2 33-44		
Head	T1SH			T2SH			T5S			Adjustable @ setting 5		
Secondary Air Damper	B			N/A			N/A			N/A		
Flue mm Diameter in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp °C	86	**88**	90	90	**93**	95	95	**98**	110	75	**90**	105
Smoke Bacarach	0			0			0			0		
Kerosene Settings												
Nozzle make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES			Danfoss 80°H		
size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85	0.85	**1.00**	1.25
Oil Pump bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0	10.0	**9.5**	9.5
Pressure psi	102	**130**	116	116	**116**	102	102	**116**	145	145	**138**	138
Max CO_2 %	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81	3.81	**4.48**	5.25
Flow Rate gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84	0.84	**0.99**	1.16
Flow Connection	22mm Copper			22mm Copper			28mm Compression			28mm Copper		
Return Connection	1" BSP Female			1" BSP Female			1" BSP Female			1¼" BSP Female		
Water litres Content gals	22 4.8			22 4.8			22 4.8			45 9.9		
Boiler Weight Dry kg	95			95			95			185		
Boiler Weight Wet kg	117			117			117			230		
SEDBUK Efficiency %	92.2			92.8			92.4			91.9		
Factory Settings	Highlighted in Bold											

2.5.7 K-Series Kabin Pak – System (KSHE)

MODEL	KS70HE			KS90HE			KS120HE		
Nominal kW	14.7	**17.6**	21	21	**23.5**	27.1	27.1	**29**	32.7
Heat Output Btu/hr	50,000	**60,000**	71,650	71,650	**80,000**	92,380	92,380	**99,050**	111,600
Nominal kW	15.3	**18.4**	22	22	**24.4**	28	28	**30**	34
Heat Input Btu/hr	52,150	**62,600**	75,000	75,000	**83,175**	95,550	95,550	**102,400**	116,000
Burner	RDB 2.2 15-21			RDB 2.2 21-26			RDB 2.2 26-33		
Head	T1SH			T2SH			T5S		
Secondary Air Damper	B			N/A			N/A		
Flue mm Diameter in	100 or 125 4 or 5			100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp °C	86	**88**	90	90	**93**	95	95	**98**	110
Smoke Bacarach	0			0			0		
Kerosene Settings									
Nozzle make	Danfoss 60°ES			Danfoss 60°ES			Danfoss 60°ES		
size	0.5	**0.5**	0.6	0.6	**0.65**	0.75	0.75	**0.85**	0.85
Oil Pump bar	7.0	**9.0**	8.0	8.0	**8.0**	7.0	7.0	**8.0**	10.0
Pressure psi	102	**130**	116	116	**116**	102	102	**116**	145
Max CO_2 %	11.5	**11.5**	11.5	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel litres/h	1.65	**1.98**	2.35	2.35	**2.65**	2.98	2.98	**3.40**	3.81
Flow Rate gals/h	0.36	**0.44**	0.52	0.52	**0.58**	0.65	0.65	**0.75**	0.84
Flow Connection	22mm Copper			22mm Copper			28mm Compression		
Return Connection	1" BSP Female			1" BSP Female			1" BSP Female		
Water litres Content gals	22 4.8			22 4.8			22 4.8		
Boiler Weight Dry kg	105			105			105		
Boiler Weight Wet kg	127			127			127		
SEDBUK Efficiency %	92.2			92.8			92.4		
Factory Settings	Highlighted in Bold								

2.5.8 K-Series Kabin Pak – Combi (KCHE)

MODEL		KC70HE			KC90HE		
Nominal Heat Output	kW Btu/hr	14.7 50,000	**17.6** **60,000**	21 71,650	21 71,650	**23.5** **80,000**	27.1 92,380
Nominal Heat Input	kW Btu/hr	15.3 52,150	**18.4** **62,600**	22 75,000	22 75,000	**24.4** **83,175**	28 95,550
Burner		RDB 2.2 15-21			RDB 2.2 21-26		
Head		T1SH			T2SH		
Secondary Air Damper		B			N/A		
Flue Diameter	mm in	100 or 125 4 or 5			100 or 125 4 or 5		
Flue Gas Temp	°C	86	**88**	90	90	**93**	95
Smoke	Bacarach	0			0		
Kerosene Settings							
Nozzle	make	Danfoss 60°ES			Danfoss 60°ES		
	size	0.5	**0.5**	0.6	0.6	**0.65**	0.75
Oil Pump Pressure	bar psi	7.0 102	**9.0** **130**	8.0 116	8.0 116	**8.0** **116**	7.0 102
Max CO_2	%	11.5	**11.5**	11.5	11.5	**11.5**	11.5
Approx Fuel Flow Rate	litres/h gals/h	1.65 0.36	**1.98** **0.44**	2.35 0.52	2.35 0.52	**2.65** **0.58**	2.98 0.65
Water Content	litres gals	74 16.3			74 16.3		
Boiler Weight Dry	kg	140			140		
Boiler Weight Wet	kg	214			214		
Domestic Hot Water (DHW) Production							
Minimum Inlet Dynamic Pressure for Maximum DHW Flow Rate	bar psi	1.8 26			1.8 26		
Maximum Achievable DHW Flow Rate		Unrestricted			Unrestricted		
Maximum Recommended DHW Flow Rate	litres/m gals/m	18 4.0			24 5.3		
Factory Set DHW Flow Rate	litres/m gals/m	18 4.0			18 4.0		
Minimum DHW Flow Rate	litres/m gals/m	2.5 0.55			2.5 0.55		
DHW Temperature Rise (at Maximum Output)		32°C @ 18 litres/min for 120 litre draw-off			32°C @ 24 litres/min for 120 litre draw-off		
Pressure Relief	bar psi	3 43.5			3 43.5		
Cold Water Mains Inlet Connection		Minimum 15mm Unrestricted			Minimum 15mm Unrestricted		
DHW Outlet Connection		22mm Copper			22mm Copper		
Flow Connection		22mm Copper			22mm Copper		
Return Connection		22mm Copper			22mm Copper		
SEDBUK Efficiency	%	90.0			90.0		
Factory Settings		Highlighted in Bold					

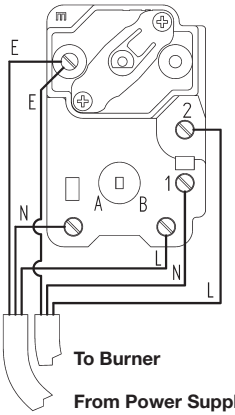
3.0 Electricity Supply & Wiring Details

220 – 240V. 1PH, 50 Hz

The boiler/burner and other external electrical equipment should be wired with heat resistant cable via a fused double pole isolating switch which should be fitted with a 5 amp fuse.

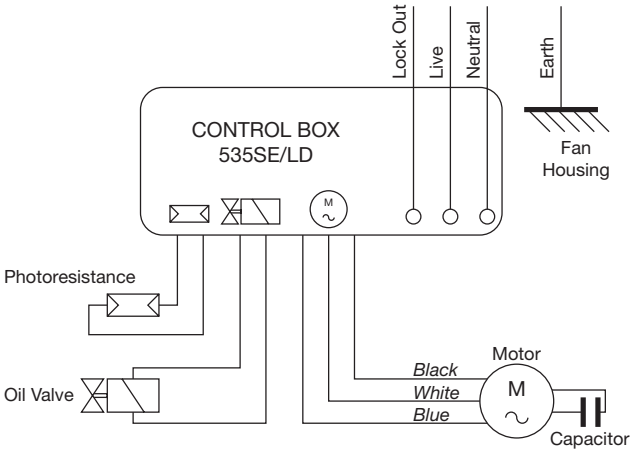
The appliance must be effectively earthed and all external wiring should comply with current IEE Regulations.

3.1 Dual-Safe Thermostat (Non-Combi Boilers)



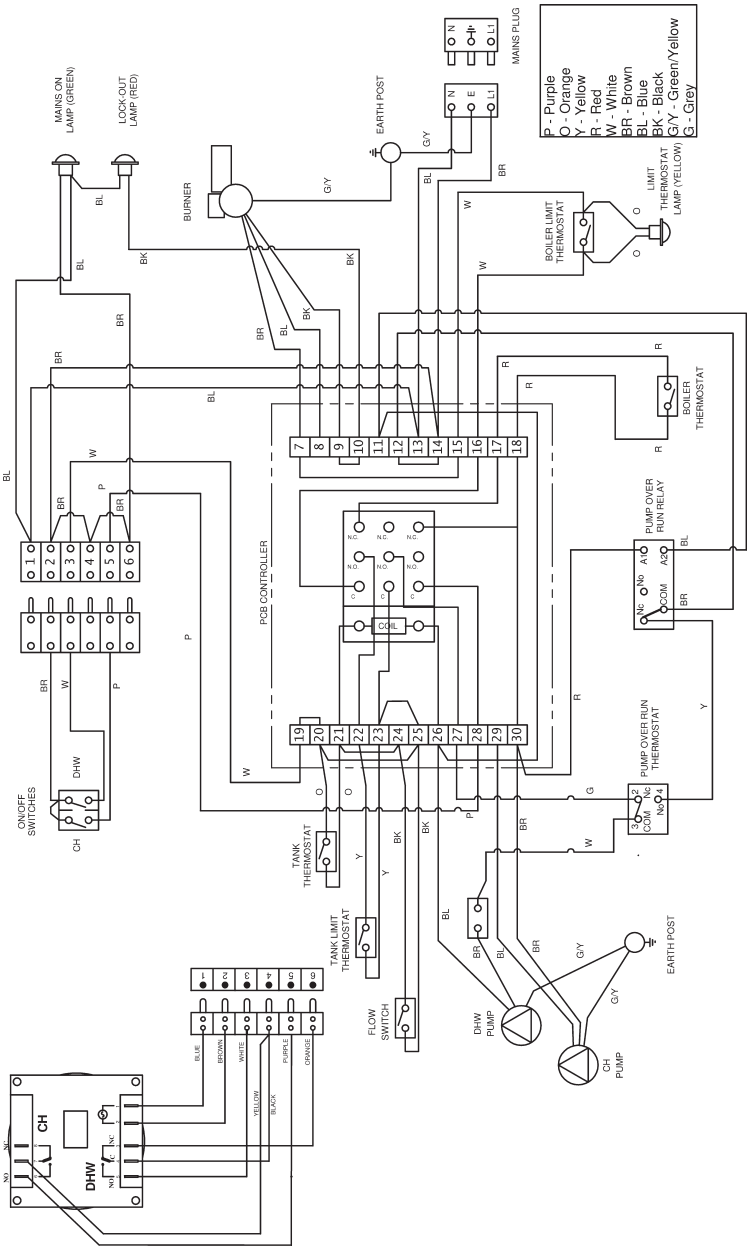
Warning: Do not fit any other wires or loop wires to this stat as this will bypass the thermostats.

3.2 RDB Burner Control Box



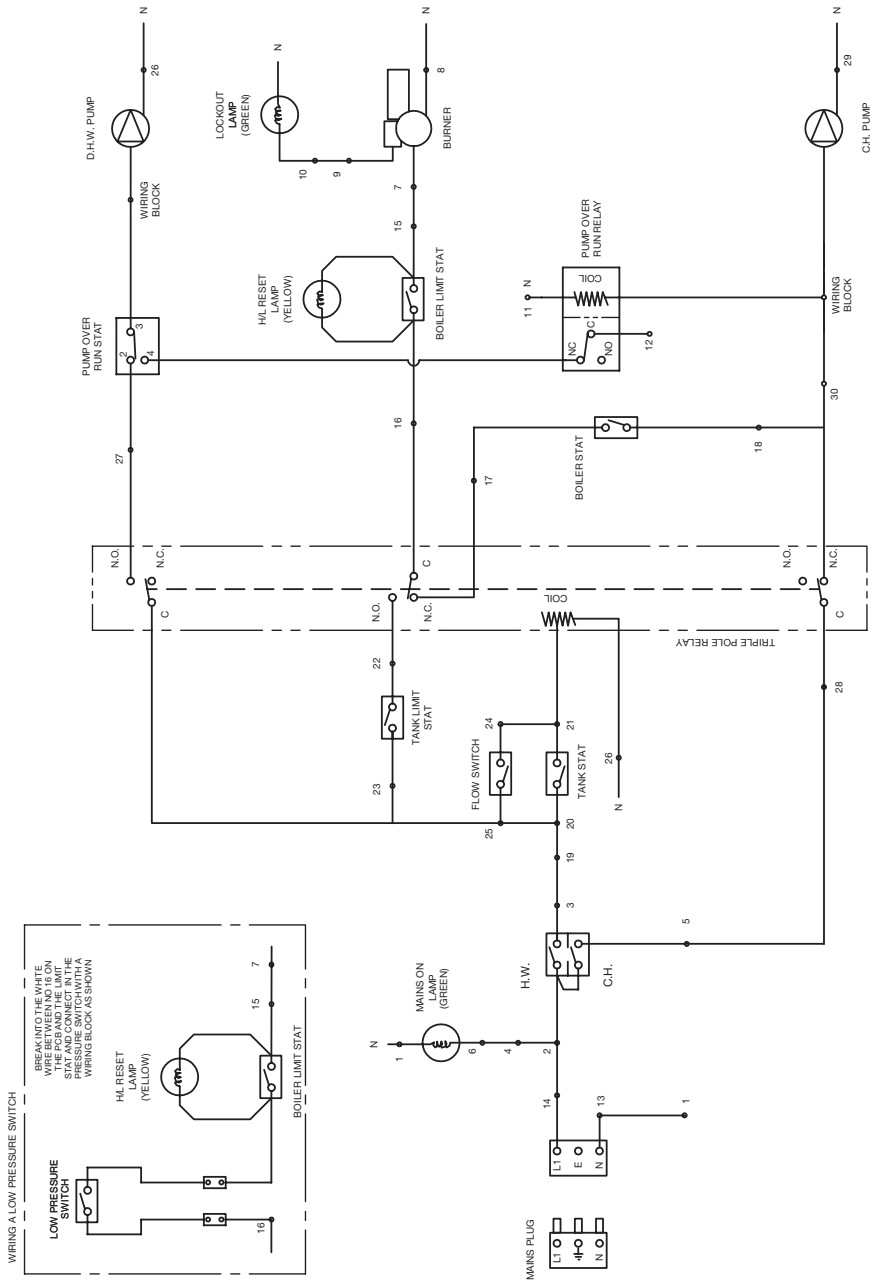
3.3 Combi Wiring Details

3.3.1 Wiring Diagram

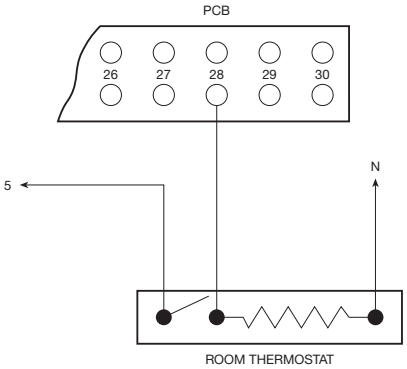


The 3 pin mains plug must be supplied with a permanent live to allow the pump overrun stat and relay to operate correctly.

3.3.2 Wiring Schematic

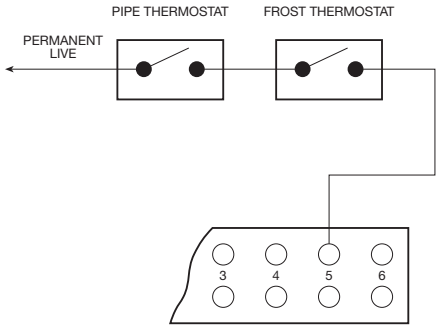


3.3.3 Fitting a Room Thermostat to a Combi



Remove the purple wire from no 5 and no 28 on the PCB and wire the thermostat as shown. The room thermostat should be located where it is not subjected to extraneous heat gains, direct sunlight or draughts.

3.3.4 Fitting Frost Protection to a Combi



In order to provide frost protection for the fabric of the building a frost thermostat should be fitted in the coldest room in the house. To prevent over heating of the property a pipe thermostat should be fitted on the return pipe close to the boiler. The Kabin Pak Combi boiler is factory fitted with a frost thermostat as standard.

3.3.5 Combi Pump Overrun Thermostat

The condensing Combi boilers have been fitted with a pump overrun thermostat. In order for the thermostat to work effectively the boiler **must** be supplied with a permanent live. Failure to do this will result in nuisance trip outs.

3.4 Installation of a Warmflow Combi Optional Programmer (PC1)

1. Disconnect the electrical supply.

2. Drop down control box front (2 screws).

3. Disconnect the 6 pin plug from the CH/HW on/off switched.

4. With a sharp knife cut out the outline of the panel knockout through the facia label from the front of the panel.

5. With a hacksaw blade or snips remove the knockout piece ensuring that all metal tags or burrs have been removed from the hole.

6. Feed the programmer and harness through the hole from the front of the panel.

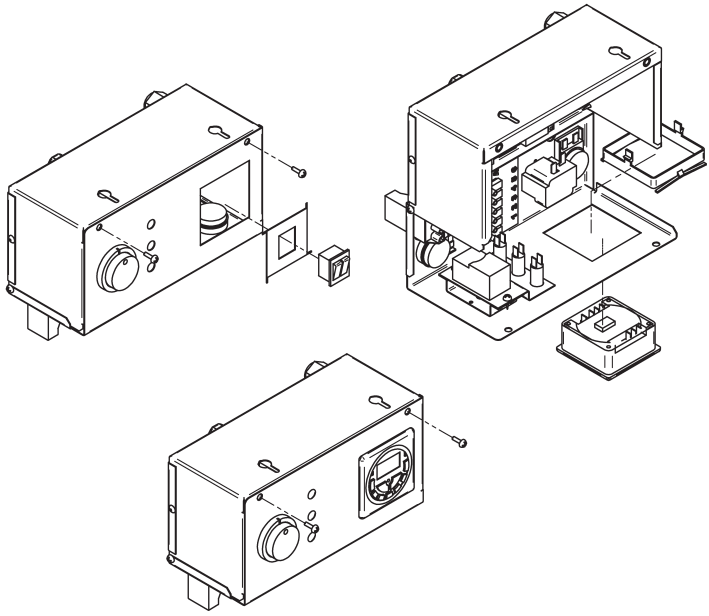
7. Secure in position by attaching the securing bracket to the rear of the programmer.

8. Plug the wiring harness into the 6 way socket.

9. Activate battery back up on the programmer by removing the plastic strip.

10. Close the control panel cover and reconnect the electrical supply.

11. Using the operating instructions located towards to back of this manual or supplied with the programmer, set the switching times.



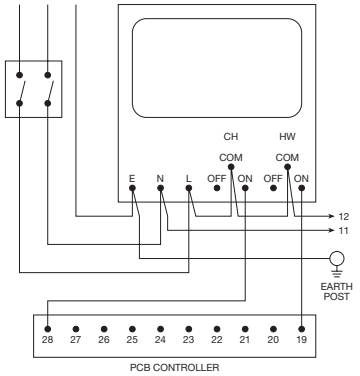
3.5 Remote Timers for Combis

3.5.1 Installation of a remote two channel programmer (option 1)

Connecting the programmer in this manner will bypass the CH and HW on/ off switches on the boiler control panel. A separate connection to the boiler 3 pin mains plug is NOT required.

Inside the boiler control panel, remove the purple and white wires connecting terminals 5 and 3 on the terminal block with terminals 19 and 28 on the PCB.

Connect the programmer to the permanent live mains supply via a fused isolator as shown.



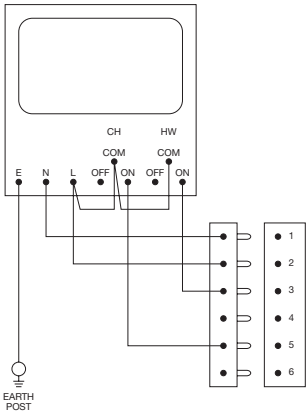
Connect the boiler to the programmer via a 5 core cable as shown ensuring that the earth is connected to one of the earth post inside the control panel and that the permanent live is connected to terminal 12 on the PCB. Failure to connect the permanent live to the boiler in this way will prevent the mains lamp and pump overrun thermostats from operating. It will also prevent the built-in frost protection of a Kabin Pak Combi from operating.

3.5.2 Installation of a remote two channel programmer (option 2)

Connecting the programmer in this manner will bypass the CH and HW on/ off switches on the boiler control panel. The boiler and programmer will both be powered from the boiler 3 pin mains plug.

Inside the boiler control panel, remove the purple, white and brown wires connecting the CH and HW switches to the 6 pin connector of the terminal block.

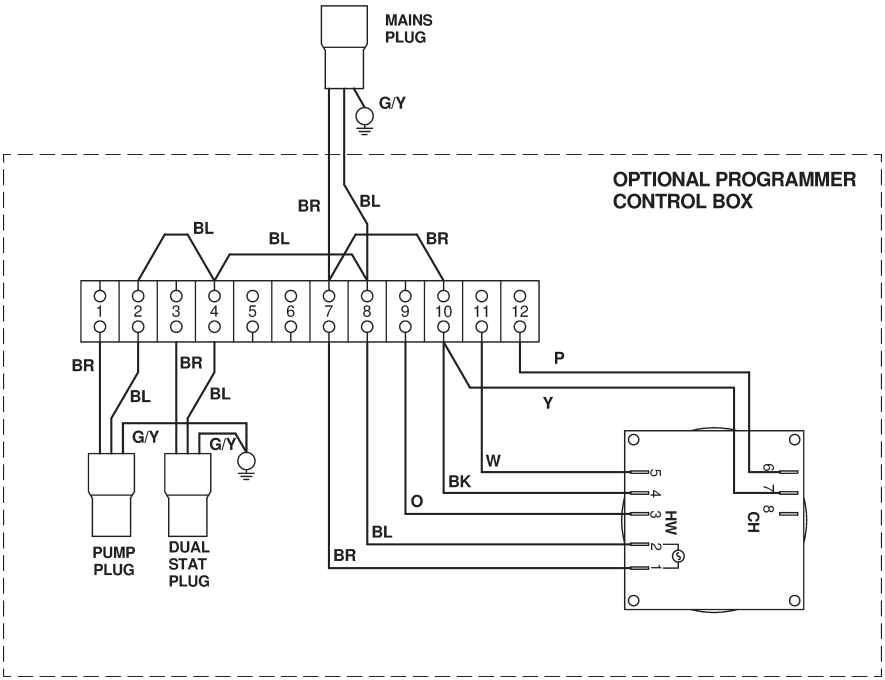
Connect the programmer to the 6 pin connector via a 5 core cable as shown ensuring the earth is connected to one of the earth posts inside the control panel.



Connect the boiler 3 pin mains plug to a permanent live mains supply via a fused isolator. Failure to connect a permanent live to the boiler will prevent the programmer, boiler mains lamp and pump overrun thermostats from operating. It will also prevent the built-in frost protection of a Kabin Pak Combi from operating.

3.6 Optional Programmer (PU1) for Non-Combi Models

3.6.1 Programmer Control Box Wiring Diagram



3.6.2 General Requirements

1. The optional programmer as supplied will supply power to the pump and burner via the central heating channel.

2. When connecting to external controls, eg 'Y' plan or 'S' plan it will be necessary to remove the loop between 3 and 12 on the programmer terminal block.

3. The programmer is not suitable for gravity hot water systems.

3.6.3 Programmer Installation

1. Disconnect electrical supply.

2. Drop down control box front (2 screws).

3. Secure control box to the horizontal casing bracket (2 screws) and right hand side (1 screw).

4. Connect the thermostat, circulating pump and the mains supply to the leads on the rear of the control box.

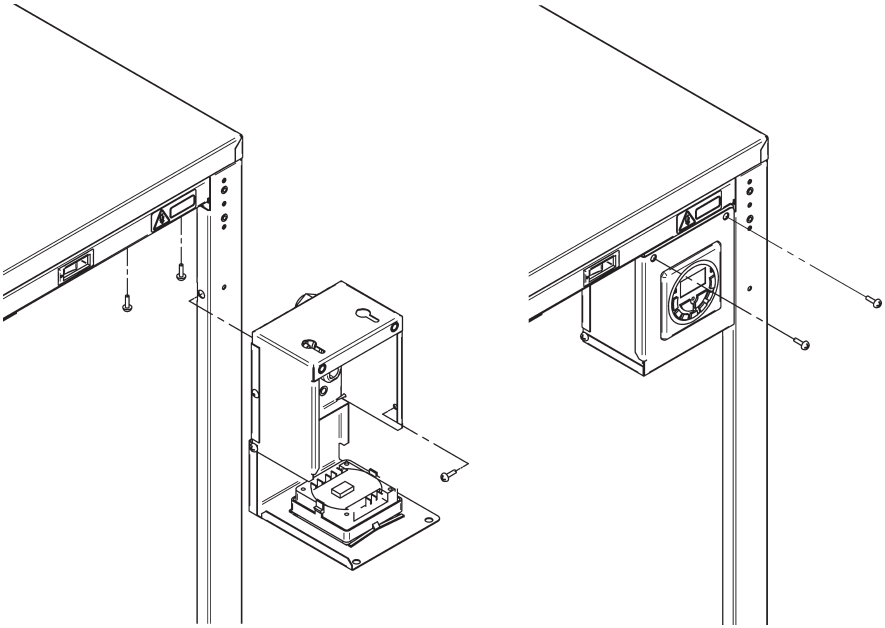
5. Two examples of system wiring are shown in the following sections.

6. If fitting the programmer to a Utility model without an integral pump, disconnect the pump plug from terminals 1 and 2 of the programmer terminal block and from the earth post. Remove the pump plug then wire the external plug into terminals 1 and 2 of the programmer terminal block and the earth post, feeding the wire in through the pump plug cable clamp.

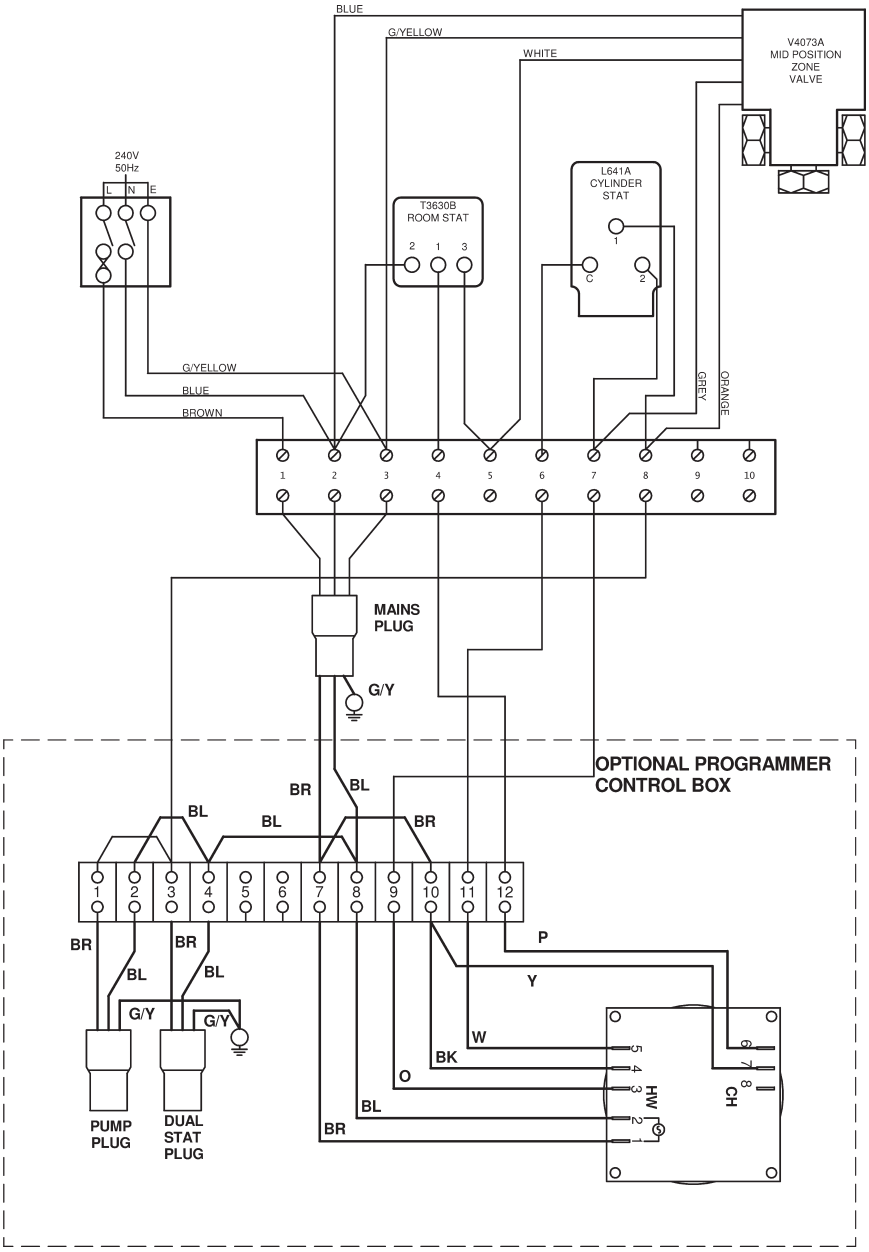
7. Activate battery backup on programmer by removing the plastic strip.

8. Close the control panel cover (2 screws) and reconnect the electrical supply.

9. Using the operating instructions located towards the back of this manual or supplied with the programmer, set the switching times.

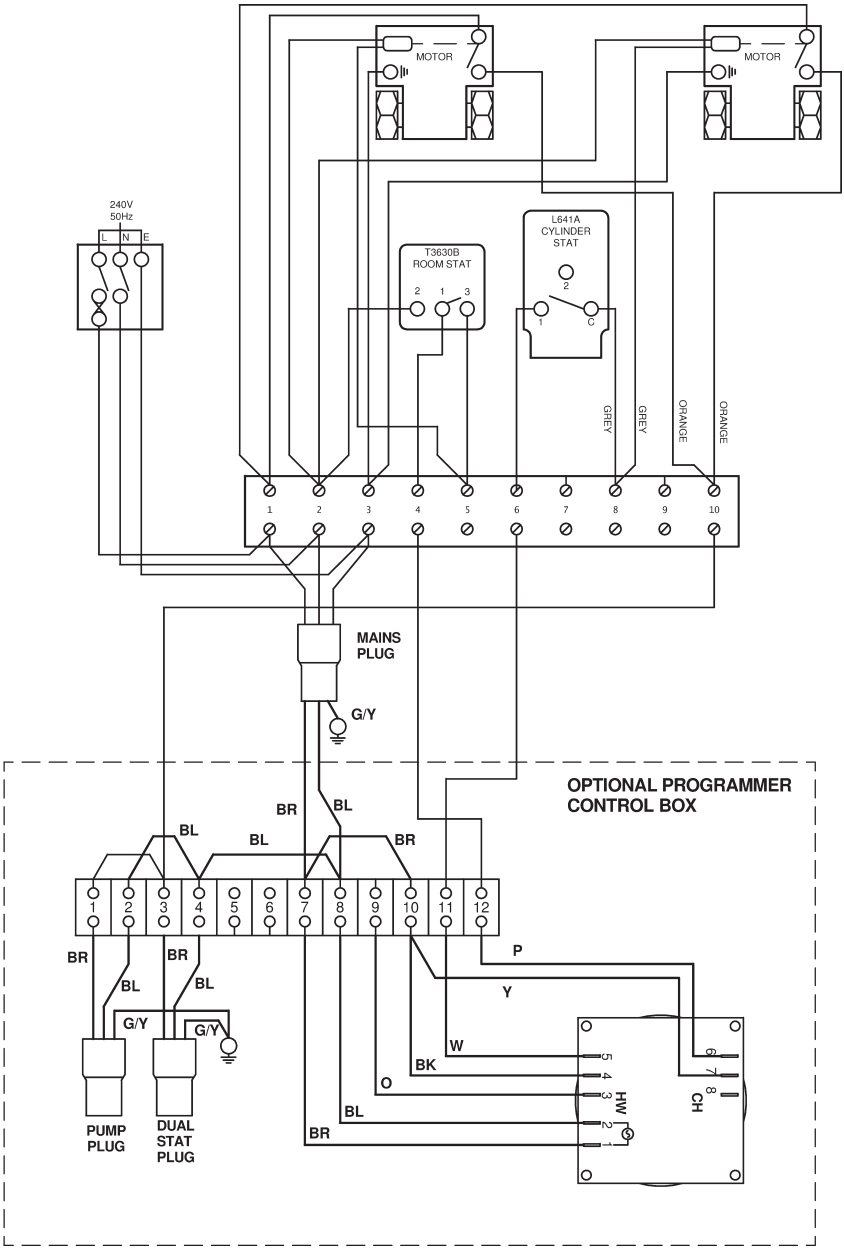


3.6.4 Honeywell 'Y' Plan – Independent CH & DHW (Fully Pumped Only)



Note: Before fitting programmer remove loop between 3 and 12 on the terminal block.

3.6.5 Honeywell 'S' Plan – Independent CH & DHW (Fully Pumped Only)



Note: Before fitting programmer remove loop between 3 and 12 on the terminal block.

4.0 Oil Supply

1. Oil Tank

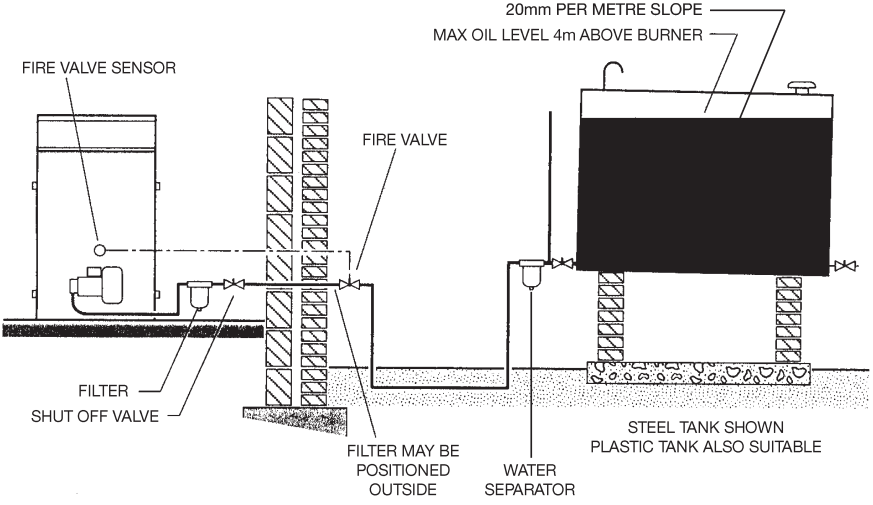
   Steel tanks constructed to BS799 : PART 5 should be painted on the outside only and mounted on piers to prevent corrosion. Plastic oil tanks are also available and can be suitable for installation at ground level. However, oil should never be stored in translucent plastic containers.

   The tank outlet should be at a height to provide sufficient clearance to allow for proper maintenance of any isolation valve, oil filter or water separator fitted.

2. The pipe from the oil tank to the burner should be run in copper, steel or aluminium. Galvanised pipe and fittings should not be used. The pipework should terminate close to the boiler and be fitted with an isolating valve and filter. A remote sensing fire valve must be fitted to the oil line preferably before the oil line enters the building (BS5410 : PART 1).

   Depending on the position of the tank a two pipe system may be required. One and two pipe oil systems are shown below. As an alternative to a two pipe system a Tigerloop or other approved de-aerator may be used.

4.1 One Pipe Gravity System

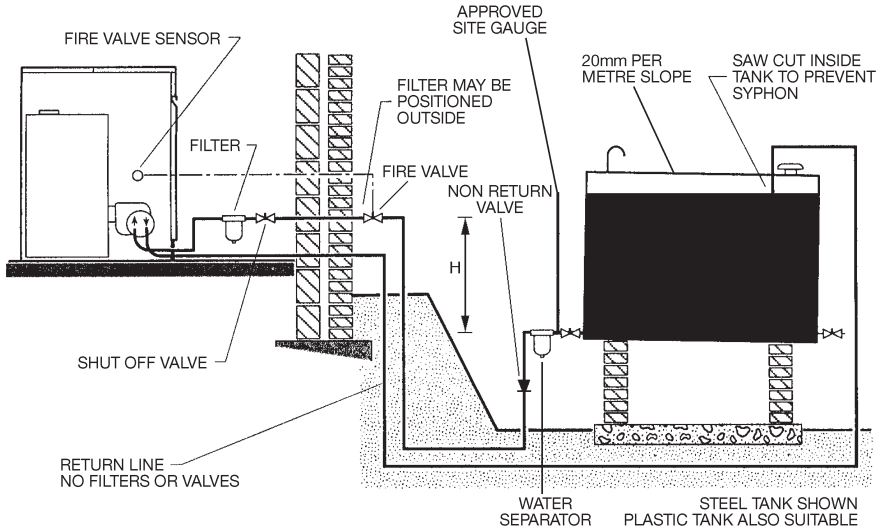


Total Maximum Pipe Length (m)

Head H(m)	0.5	1	1.5	2
ID 8mm	10	20	40	60
ID 10mm	20	40	80	100

Note: Plastic oil level gauges may shrink when exposed to kerosene thus allowing the ingress of water. Pump failures due to water contamination are not covered under the warranty.

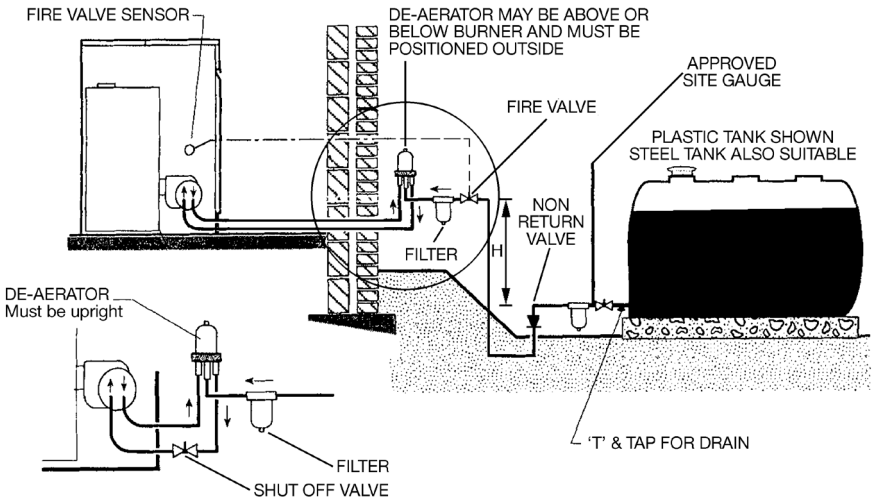
4.2 Two Pipe System



Total Maximum Pipe Length (m)

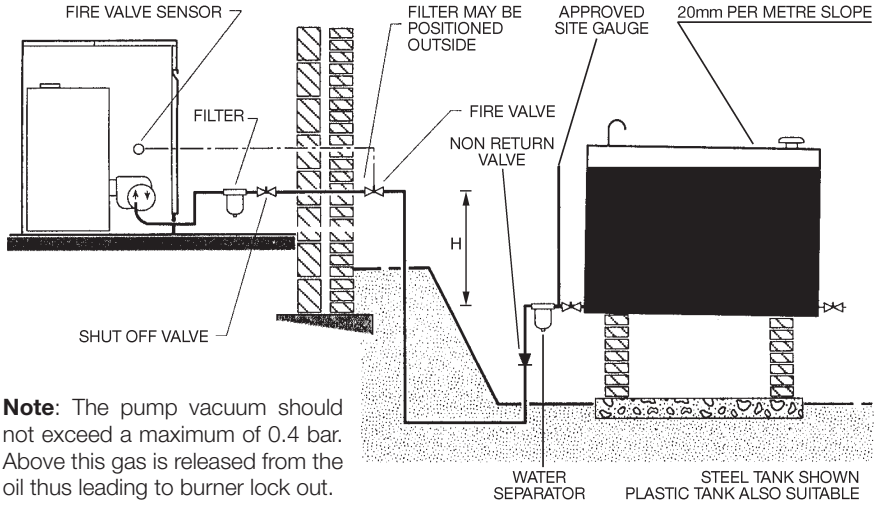
Head H(m)	0.5	0.5	1	1.5	2	3	3.5
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

4.3 De-aerator System



For maximum pipe length and lift contact de-aerator manufacturer.

4.4 One Pipe Lift System



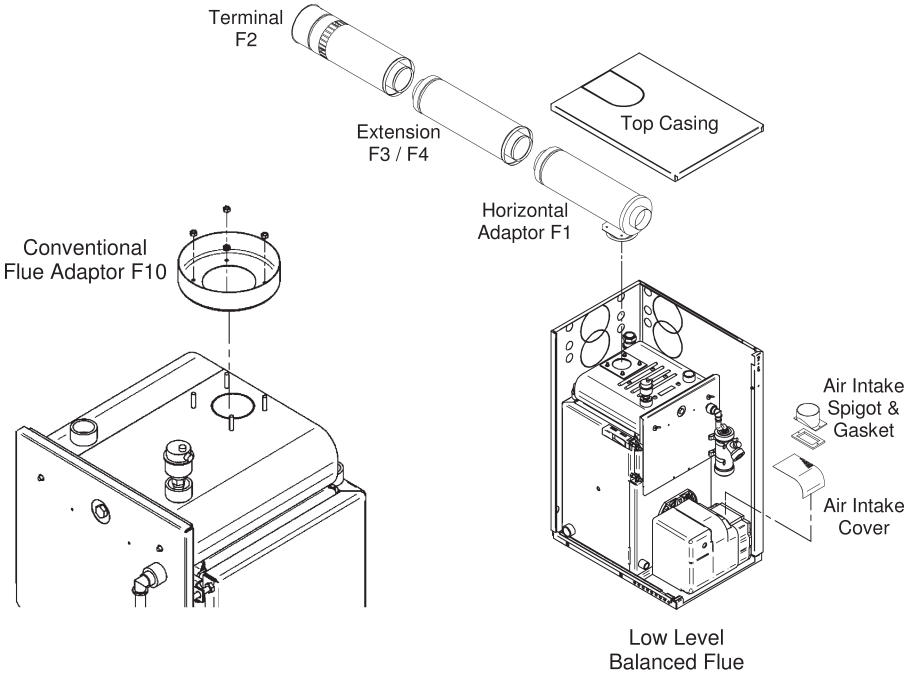
Note: The pump vacuum should not exceed a maximum of 0.4 bar. Above this gas is released from the oil thus leading to burner lock out.

Total Maximum Pipe Length (m)

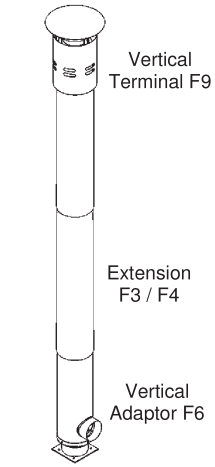
Head H(m)	0.5	0.5	1	1.5	2	3	3.5
ID 8mm	35	30	25	20	15	8	6
ID 10mm	100	100	100	90	70	30	20

5.0 Flues

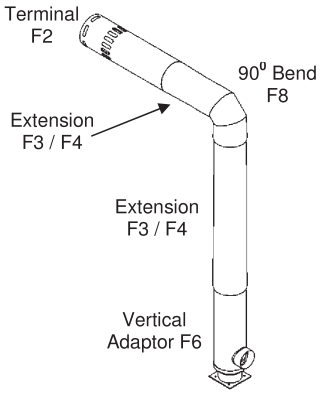
5.1 Installation of Flues



Low Level
Balanced Flue



Vertical
Balanced Flue



High Level
Balanced Flue

5.1.1 Installation of a Balanced Flue (FBF)

1. Make a suitable sized hole in the wall or ceiling for the flue. For the dimensions of the boiler, see the Dimensions Section of this manual. For the dimensions of the flue system, see the Flue Kits & Dimensions Section of this manual.

   Note: The cavities around the opening must be sealed and protected by a non-combustible sleeve.

2. Remove the top casing panel. If fitting a low level horizontal flue (FBF), remove the upper casing panel knockout from the appropriate side or rear panel using a pair of tin snips. Push the boiler into position against the wall then install the flue starter piece, securing it in position using the nuts provided and ensuring the black rubber gasket is correctly seated. The white fibre gasket supplied in the Flue Fittings Kit (FFK) is not required and should NOT be fitted.

3. If installing extension pieces, ensure the seals are correctly fitted and lubricated before pushing through the wall and into the starter piece.

   Note: Refer to the Flue Options, Components and Dimensions Section for details of the maximum number of extension pieces and total flue lengths allowed.

4. If installing a vertical flue, correctly fit the flashing kit then slide the flue terminal into position with a twisting movement. Ensure that the terminal protrudes through the roof by a minimum of 665mm.

   If installing a horizontal flue, slide the flue terminal into position with a twisting movement then seal the gap between the flue and the wall both inside and outside. Ensure that the terminal protrudes through the wall by a minimum of 175mm and a maximum of 225mm.

   If installing a Plume Management Kit, fit the starter piece and horizontal terminal as described above then install the Plume Management Kit as instructed in the leaflet supplied with the kit."

5. If installing a low-level horizontal flue, fit the terminal guard (basket) over the flue terminal using the cardboard mounting template supplied with the flue kit to locate and drill the necessary screw holes in the wall.

6. Remove the air inlet cover from the burner then fit the intake adaptor spigot and gasket. Connect one end of the air duct / hose to the flue and the other end to the adaptor spigot and secure.

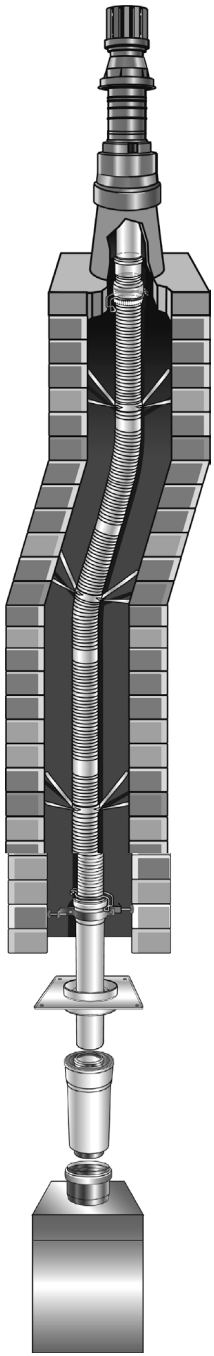
5.2 Conventional Flues

The flue system should be designed in accordance with local bye-laws and the Building Regulations. Draught stabilisers are not recommended for oil fired boilers. Sharp bends or horizontal runs should be avoided and the flue should terminate 2 feet (600mm) above the ridge of the dwelling. Terminals which restrict the discharge or allow ingress of water should be avoided.

When connecting to an existing masonry chimney, a flexible flue liner suitable for use with oil fired condensing boilers and of an appropriate diameter must be used. The annular space must be filled with insulation and sealed top and bottom. The starter piece should be sealed into the conventional flue adaptor using a high temperature silicone sealant, fire cement must not be used.

Only proprietary flue systems designed specifically for use with oil-fired condensing boilers may be used. The flue system manufacturer's installation instruction must be followed.

For recommended conventional flue systems, contact Warmflow.



5.3 Low Level Balanced Flue Terminal Positions

Attention should be given to the position of the flue discharge; we recommend the following guidelines be adopted.

1. The flue should not discharge beneath opening windows or near other accesses to the building.

2. The flue should not discharge near internal/external corners of the building where turbulent wind conditions could occur.

3. A terminal guard must be fitted at all times.

4. The terminal should not discharge over property boundaries.

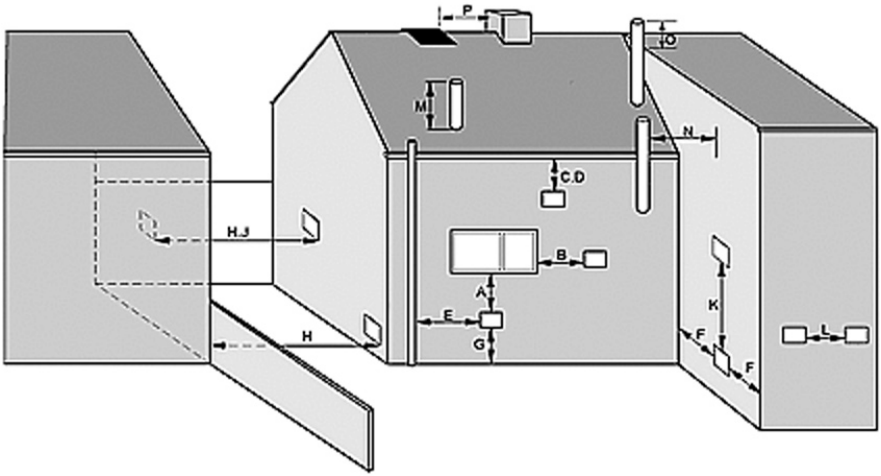
5. Discharge into narrow passageways should be avoided.

6. The location of the terminal and routing of the flue should be determined by the installer after consultation with the householder.

7. In positioning the flue the wind direction should be considered.

   Installation in exposed positions is not recommended.

8. Account must be made of the pluming from the flue. If it is likely to be a nuisance to the householder the use of a vertical balanced flue or conventional flue should be considered.



MINIMUM DISTANCES TO TERMINALS IN MILLIMETRES AS MEASURED FROM THE TOP OF THE CHIMNEY OR THE RIM OF A LOW LEVEL DISCHARGE OPENING		
A	Directly below an opening, air brick, opening window etc.	600
B	Horizontally to an opening, air brick, opening window etc.	600
C	Below a gutter, eaves or balcony with protection.	75
D	Below a gutter or a balcony without protection.	600
E	From vertical sanitary pipework.	300
F	From an internal or external corner or surface or boundary alongside the terminal.	300
G	Above ground or balcony level.	300
H	From a surface or a boundary facing the terminal.	600
J	From a terminal facing the terminal.	1,200
K	Vertically from a terminal on the same wall.	1,500
L	Horizontally from a terminal on the same wall.	750
M	Above the highest point of an intersection with the roof.	600
N	From a vertical structure on the side of the terminal.	750
O	Above a vertical structure less than 750mm from the side of the terminal.	600
P	From a ridge terminal to a vertical structure on the roof.	1,500

These are minimum dimensions and are only quoted as a guidelines.

Terminating positions must be at least 1.8 metres from an oil storage tank unless a wall with at least 30 min fire resistance and extending 300mm higher and wider than the tank is provided between the tank and the terminating position.

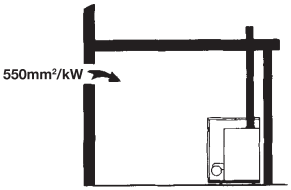
6.0 Air Supply for Combustion & Ventilation (see BS5410)

6.1 Open Flue Boilers

When the boiler is sited in a cellar where the only access for combustion and ventilation air is at high level then the combustion air should be ducted to low level.

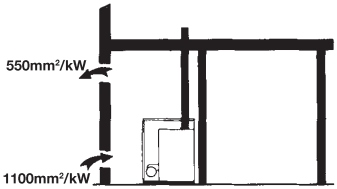
Combustion Air Supply

Boiler in Room

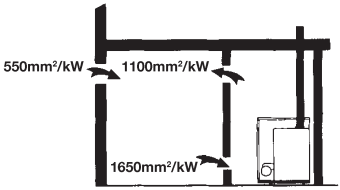


OPEN FLUE

Boiler in Compartment

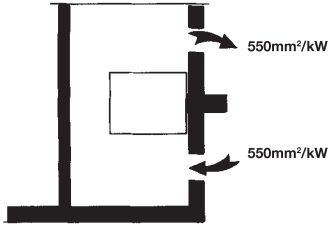


OPEN FLUE
COMPARTMENT
VENTILATED FROM OUTSIDE

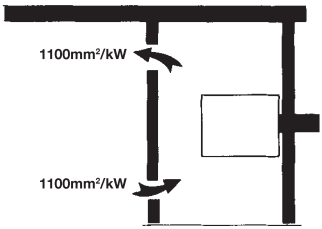


OPEN FLUE
COMPARTMENT
VENTILATED FROM ROOM

6.2 Balanced Flue Boilers – Boilers in a Compartment



VENTILATED FROM OUTSIDE



VENTILATED FROM ROOM

Air Supply for Ventilation
No Combustion Air Inlet required to Room

7.0 Installation Requirements

The boiler installation must be in compliance with BS5410 : PART 1 and the Building Regulations.

7.1 General Requirements

7.1.1 Hearth

The boiler has a hearth temperature of between 50°C and 85°C and should be stood on a rigid, non-porous, non-combustible base, which is not softened by warmth, to comply with the Building Regulations.

7.1.2 Service Access

24" (600mm) Clearance should be provided above and in front of the boiler to allow for routine servicing. Pumped, System and Combi models may require access to the top.

7.1.3 Heating System

The heating system should be installed to HVCA current codes of practice. Before installing the boiler the new or existing system must be thoroughly flushed to clear all sludge or other foreign matter such as solder, steel wool and copper filings. The system must be cleansed, neutralised and protected from corrosion in accordance with BS5449 and BS7593 using suitable cleansing agent(s) and inhibitor(s) and carried out in accordance with the cleanser / inhibitor manufacturers' instructions. The system must be dosed to the concentrations specified by the inhibitor manufacturer (refer to the Technical Data section of this manual for the volume of the boiler when calculating the total system volume). Failure of components such as, but not limited to, pumps, auto air vents, pressure relief valves, plate heat exchangers and non-return valves due to corrosion product in the system will not be covered by warranty.

7.1.4 Air Vents

The plastic plugs of the auto air vent(s) factory-fitted to the boiler must be loosened when filling the system in order to bleed the air from the boiler. In addition to any factory fitted air vents it is recommended that another air vent is fitted at the highest point in the system. Where the flow pipework drops down from the boiler the installer must ensure that an automatic air vent is fitted to the top of the pipework to prevent air being trapped in the boiler.

7.1.5 Drain Cock

For all appliances not factory-fitted with drain cocks, one should be fitted to the boiler drain boss located to the left hand side of the burner. Drain cocks should also be fitted to the lowest points in the system to allow the system to be completely drained.

7.1.6 Frost Protection

Where there is a risk to the boiler or installation from frost then a suitable frost thermostat should be fitted. Alternatively the system could be dosed with an anti freeze agent. The Kabin Pak Combi boiler is factory fitted with a frost thermostat as standard. For all other Kabin Pak models covered by this manual a Frost Thermostat Kit (Code FSK1) is available as an optional extra.

7.1.7 Pipework

We strongly advise that all installation pipework is run in copper. However, if plastic pipe is used, it must be recommended by the pipe manufacturer for use with oil fired appliances and, in any case, the last 1000mm of pipework connected directly to the appliance must be of copper. All connections to the appliance must be made with compression fittings.

7.2 Sealed Systems

7.2.1 Expansion Vessel

Refer to BS7074: PART 1 and BS5449 for details of expansion vessel sizing. The values given in the table below are for total system volumes which include the primary water capacity of the boiler which can be found in the Technical Data section of this manual. System and Combi models up to 120HE are supplied with a 12 litre expansion vessel charged to 1.0 bar. This can accommodate a maximum combined boiler and system volume of 110 litres. Where permitted by the type, size and configuration of heating system the expansion vessel bladder pre-charge pressure can be reduced, prior to filling the system, to 0.5 bar in order to accommodate a total system volume of 145 litres. If these maximum total system volumes are exceed, additional expansion capacity will be required.

VESSEL VOLUMES													
INITIAL CHARGE	0.5	2.1	4.2	6.3	8.3	10.5	12.5	14.6	16.7	18.7	20.8	22.9	25.0
	1.0	2.7	5.4	8.2	10.9	13.6	16.3	19.1	21.8	24.5	27.2	30.0	32.7
	1.5	2.9	7.8	11.7	15.6	19.5	23.4	27.3	31.2	35.1	39.0	42.9	46.8
TOTAL SYSTEM VOLUME		25	50	75	100	125	150	175	200	225	250	275	300

When measuring the expansion vessel bladder pre-charge pressure, using a tyre gauge, the system should be cold and the system pressure should be relieved (by manually operating the system pressure relief valve) in order to obtain an accurate reading.

7.2.2 System Filling

For all System and Combi boilers a filling point complete with a filling loop is supplied fitted to the expansion vessel. The filling loop **must** be disconnected from the mains supply after filling. A system pressure when cold of 1 bar is recommended. After filling, vent all air from the system. The plastic plugs of the auto air vent(s) factory-fitted to the boiler must be loosened when filling the system in order to bleed the air from the boiler.

7.2.3 System Pressure

Water loss from the system as indicated by a reduction in pressure on the pressure gauge may be made up through the filling loop. In the first week of operation it is normal to see a drop in system pressure. After this time the system pressure must be rechecked and the system refilled. Failure to do so may lead to boiler faults.

7.2.4 Pressure Relief Valve

Any pressure relief valve fitted to the boiler or system must be able to discharge externally to a drain where the discharge can be seen but cannot cause any injury or damage. No other valves should be positioned between the relief valve and discharge termination.

7.2.5 Low Pressure Switch

Where there is a catastrophic loss of water from the system the boiler thermostats may fail to operate which would result in serious damage to the appliance. To prevent this it is recommended that a low pressure cut out switch set at 0.2 bar is fitted to **the system** and wired in series with the boiler limit thermostat.

7.3 Combi Domestic Hot Water

7.3.1 Mains Water Pressure

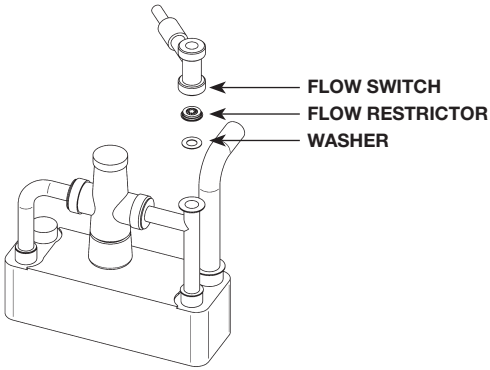
To protect the appliance and to prevent excessive flow rates, a pressure reducing valve must be fitted to limit the maximum supply pressure to 3 bar. We strongly advise that all installation pipework is run in copper. However, if plastic pipe is used, it must be recommended by the pipe manufacturer for use with oil fired appliances and, in any case, the last 1000mm of pipework connected directly to the appliance must be of copper. Whenever a pressure reducing valve or other device containing a non-return valve is fitted to the mains water supply entering the boiler, a mini expansion vessel must be fitted after the device in order to protect the appliance from the expansion due to heating of the water in the domestic hot water pipework. Note that the flow rate from individual taps is dependant on the number of outlets being operated together, as well as the length and size of pipework and the mains supply pressure.

7.3.2 Water Hardness

Although many of the DHW components are designed to resist lime scale formation, in areas of hard water it may still be necessary to fit an inline chemical water softener. For further information contact Warmflow and your local water company.

7.3.4 Flow Restrictor

An 18L/min flow restrictor has been factory fitted but can be easily removed if required.

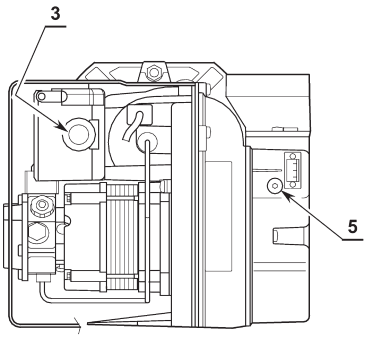


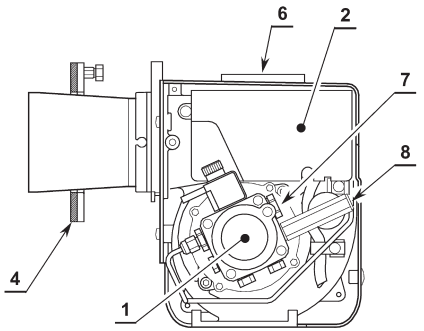
7.3.5 Boreholes

Where the mains water supply to the boiler is fed from a borehole via a pump and accumulator arrangement the variable pressure can cause the mixer valve to go to its fail safe settings thus preventing the outlet water temperature from achieving a suitable level. In order to minimise the pressure variations it is recommended that differential on the borehole pump pressure switch is kept as low as possible without adversely affecting the pump motor. The accumulator must be as large as possible in order to reduce the rate of pressure change and a pressure reducing valve (PRV) must be situated between the pump and accumulator and the boiler. The PRV must be set slightly below the minimum setting of the pressure switch on the pump.

8.0 Burners

8.1 RDB Burner



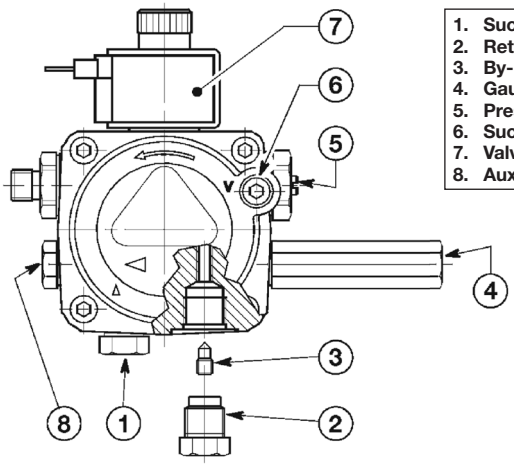


1. Pump
2. Control Box
3. Reset Button with Lock-Out Lamp
4. Flange with Insulating Gasket

5. Air Damper Adjustment Screw
6. Air Tube Connection (Supplied with BF Kit)
7. Pump Pressure Adjustment Screw
8. Pressure Gauge Port

8.2 Oil Pump

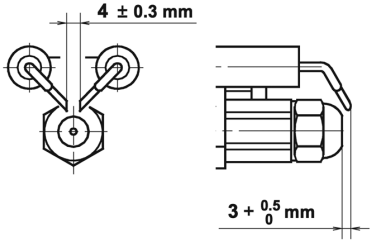
The burner is supplied for use with a one pipe system. For use on a two pipe system, it is necessary to remove the return port plug and fit a small by-pass plug as shown.



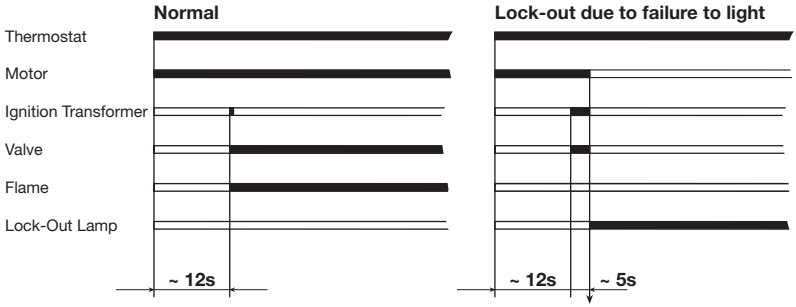
1. Suction Line
2. Return Line
3. By-Pass Screw
4. Gauge Connection
5. Pressure Adjuster
6. Suction Gauge Connection
7. Valve
8. Auxiliary Pressure Test Point

8.3 Electrode Setting

When removing or replacing the nozzle, move the electrodes forward to avoid the risk of damage. The electrodes are slackened by unscrewing the brass post that passes from the electrode holder out of the side of the burner. When work is complete, ensure the electrodes are reset as shown and secured by tightening the brass post.



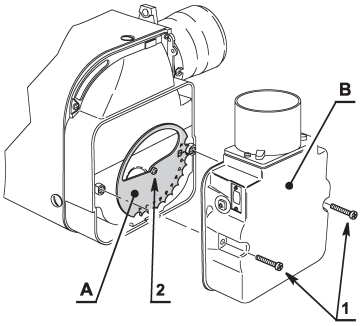
8.4 Burner Start-Up Cycle



8.5 Air Damper Adjustment

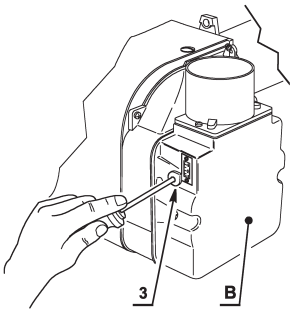
The air damper is set in factory. This regulation is purely indicative. Each installation however, has its own working conditions: actual nozzle output; positive or negative pressure in the combustion chamber, the need of excess air, etc. All these conditions may require a different air damper setting.

Air Damper (A) – 15/21 Burner Only



Air Damper (A) – The main air damper can be set in either of two positions. To set the positions of the damper, proceed as follows: Remove the secondary air damper (B) loosening the screws (1). Loosen the screw (2) and rotate the main air damper (A) to the required position. Retighten the screw (2) and put back the secondary air damper (B).

Air Damper (B)



Air Damper (B) – The purpose of this damper is to perform a fine-tuning of the inlet air. Tuning of this device is possible by turning the screw (3).

9.0 Commissioning & Servicing

9.1 Commissioning

Note: It is the responsibility of the installer to ensure that the boiler is properly commissioned by an OFTEC trained and registered technician. Failure to do so WILL invalidate ALL warranties.

Before firing ensure that all the baffles are in place, as they may have been displaced during transit; Refer to the General Information section. Switch the boiler on, ensuring all controls are calling for heat.

The oil pump pressure must be checked by fitting a pressure gauge to the pump pressure port. If necessary the pressure should be adjusted until it corresponds with the value in the Technical Data section for the required output. Using a smoke pump, check the smoke number. It should be zero.

Using a flue gas analyser, check the CO2 content and flue gas temperature once the boiler is hot. Testing while the boiler is still relatively cold gives inaccurate results and leads to incorrect adjustments being made.

Where a balanced flue has been fitted ensure the air duct connecting the flue and burner has been properly connected before commissioning.

To comply with the building regulations OFTEC form CD11 should be completed and a copy left with the householder.

9.2 Servicing

9.2.1 General Requirements

It is recommended that the appliance is serviced annually by a Warmflow or an OFTEC registered service technician in accordance with the recommendations laid out in OFTEC's technical information book 2 – 'Pressure Jet Appliances – Commissioning Requirements for Technicians'.

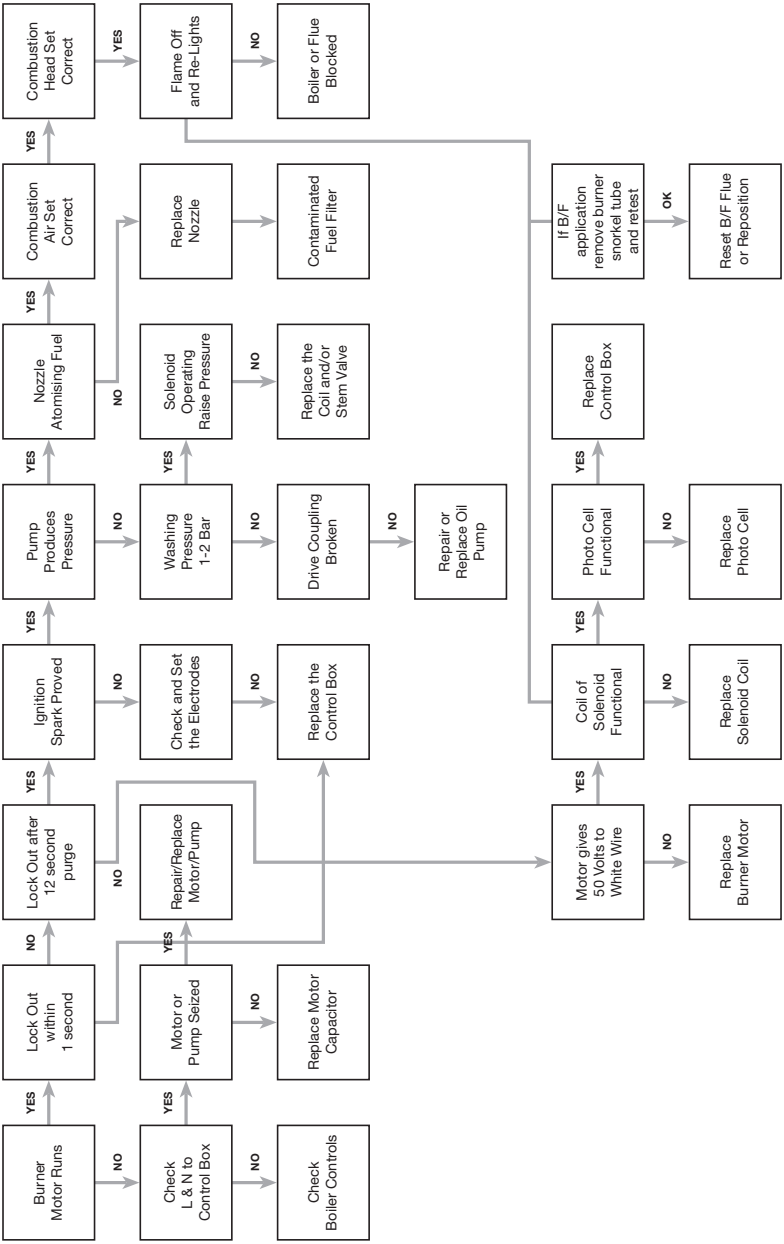
Additionally, when servicing, special attention should be paid to the condition of the oil nozzle, flexible oil line, fuel filter, door insulation, sealing rope and secondary heat exchanger door seal. If found to be defective they must be replaced.

The system corrosion inhibitor level must be checked (instant on-site test kits are available from inhibitor manufacturers) and additional inhibitor must be added if the system is found to be under-dosed. Refer to the inhibitor manufacturer for further guidance.

Note: All product warranties will be invalidated if the appliance is not serviced annually by a Warmflow or OFTEC trained and registered technician.

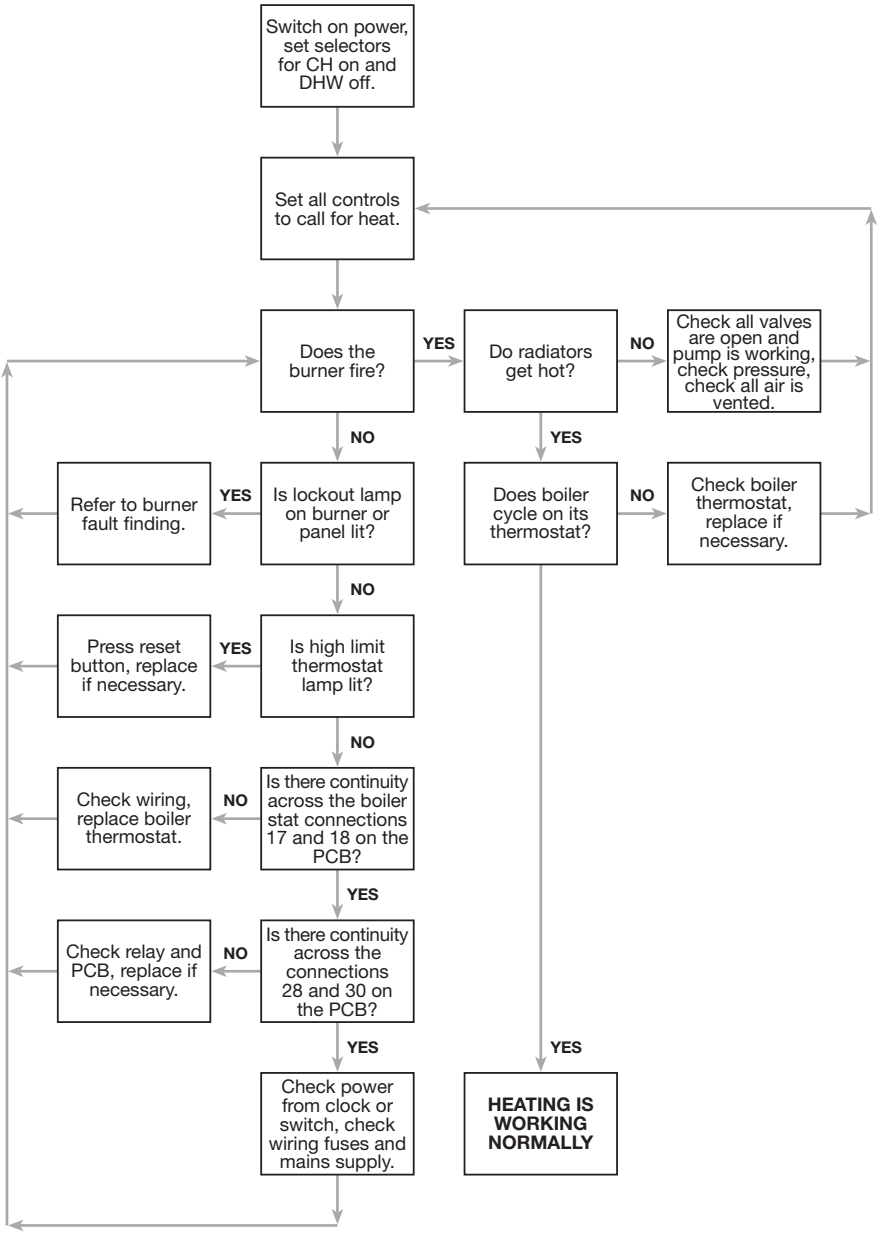
10.0 Burner Fault Finding

10.1 Riello RDB

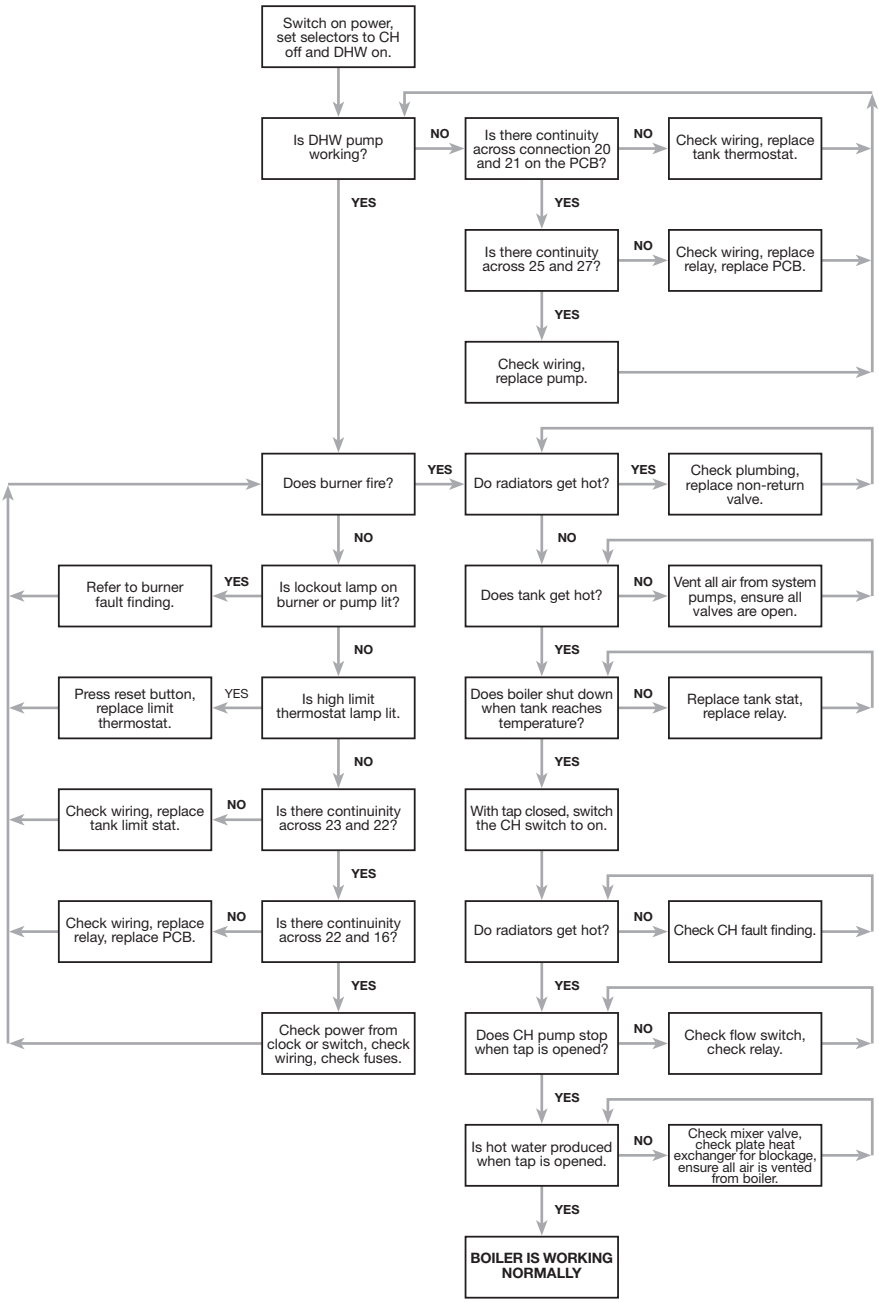


11.0 Combi Fault Finding

11.1 Central Heating


Switch on power, set selectors for CH on and DHW off.
Set all controls to call for heat.
Does the burner fire?
YES
Do radiators get hot?
NO
Check all valves are open and pump is working, check pressure, check all air is vented.
NO
YES
Refer to burner fault finding.
YES
Is lockout lamp on burner or panel lit?
Does boiler cycle on its thermostat?
NO
Check boiler thermostat, replace if necessary.
NO
Press reset button, replace if necessary.
YES
Is high limit thermostat lamp lit?
NO
Check wiring, replace boiler thermostat.
NO
Is there continuity across the boiler stat connections 17 and 18 on the PCB?
YES
Check relay and PCB, replace if necessary.
NO
Is there continuity across the connections 28 and 30 on the PCB?
YES
YES
Check power from clock or switch, check wiring fuses and mains supply.
HEATING IS WORKING NORMALLY

11.2 Domestic Hot Water


Switch on power, set selectors to CH off and DHW on.
Is DHW pump working?
NO
Is there continuity across connection 20 and 21 on the PCB?
NO
Check wiring, replace tank thermostat.
YES
YES
Is there continuity across 25 and 27?
NO
Check wiring, replace relay, replace PCB.
YES
Check wiring, replace pump.
Does burner fire?
YES
Do radiators get hot?
YES
Check plumbing, replace non-return valve.
NO
NO
Refer to burner fault finding.
YES
Is lockout lamp on burner or pump lit?
Does tank get hot?
NO
Vent all air from system pumps, ensure all valves are open.
NO
YES
Press reset button, replace limit thermostat.
YES
Is high limit thermostat lamp lit.
Does boiler shut down when tank reaches temperature?
NO
Replace tank stat, replace relay.
NO
YES
Check wiring, replace tank limit stat.
NO
Is there continuinity across 23 and 22?
With tap closed, switch the CH switch to on.
YES
Check wiring, replace relay, replace PCB.
NO
Is there continuinity across 22 and 16?
Do radiators get hot?
NO
Check CH fault finding.
YES
YES
Check power from clock or switch, check wiring, check fuses.
Does CH pump stop when tap is opened?
NO
Check flow switch, check relay.
YES
Is hot water produced when tap is opened.
NO
Check mixer valve, check plate heat exchanger for blockage, ensure all air is vented from boiler.
YES
BOILER IS WORKING NORMALLY

12.0 Optional Boiler Mounted Digital Timer

12.1 Operating Instructions

12.1.1 After Installation

When you first install the Cr2032 battery (by removing the clear plastic strip from the rear of the timer) you must press the 'RESET' button, the LCD display will display fully for 3 seconds. Then LCD display will change to '5:2d'. You can press DAY button to select '7d', '24H' programme mode.

This configures the timer as follows:

5/2d: 5 day/2 day programme option allows different ON/OFF times on weekday and weekend.

7d: 7 day programme option allows different programme setting on each day of weekday and weekend.

24H: 24 hours programme option runs same programme every day.

When you finalise the setting, press the CLOCK button for normal operation.

12.1.2 Built in Programme

For convenience, the timer module has a built in programme, however, it can be easily adjusted (see section 12.5 To Change the Programmes).

The timer offers 3 options for both CH and HW programme period.

OFF: Off all the time.

AUTO: To run your time schedule for period one or two or three each day.

ON: Turn on all the time.

Factory Present Time Schedule

Switching	*Mon – Fri Time Schedule*		*Mon – Fri Time Schedule*	
	CH/CH1	*HW/CH2*	*CH/CH1*	*HW/CH2*
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	08:30	08:30	10:30	10:30
PERIOD 2 ON	12:00	12:00	12:00	12:00
PERIOD 2 OFF	14:00	14:00	14:00	14:00
PERIOD 3 ON	16:30	16:30	16:30	16:30
PERIOD 3 OFF	22:30	22:30	22:30	22:30

12.1.3 To Set Current Time & Day

1. Press and hold **CLOCK** button then press **DAY** button to select current day of the week.

2. Press and hold **CLOCK** button then press **HOUR** button until the correct hour is displayed.

3. Press and hold **CLOCK** button then press **MINUTE** button until the correct minute is displayed.

12.1.4 Select Operation Mode

Press CH SELECT / HW SELECT button to select operation mode to be **OFF**, **AUTO**, **ON**.

12.1.5 To Set Programme Period

Press and hold **DAY** button and press **MIN** until the correct programme period is displayed.

Set Day Programme Period 1 On/Off

Switching	*Mon – Fri Time Schedule*		*Mon – Fri Time Schedule*	
	CH/CH1	*HW/CH2*	*CH/CH1*	*HW/CH2*
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	22:30	22:30	22:30	22:30

Set Day Programme Period 2 On/Off

Switching	*Mon – Fri Time Schedule*		*Mon – Fri Time Schedule*	
	CH/CH1	*HW/CH2*	*CH/CH1*	*HW/CH2*
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	08:30	08:30	10:30	10:30
PERIOD 2 ON	16:30	16:30	16:30	16:30
PERIOD 2 OFF	22:30	22:30	22:30	22:30

Set Day Programme Period 3 On/Off

Switching	*Mon – Fri Time Schedule*		*Mon – Fri Time Schedule*	
	CH/CH1	*HW/CH2*	*CH/CH1*	*HW/CH2*
PERIOD 1 ON	06:30	06:30	07:30	07:30
PERIOD 1 OFF	08:30	08:30	10:30	10:30
PERIOD 2 ON	12:00	12:00	12:00	12:00
PERIOD 2 OFF	14:00	14:00	14:00	14:00
PERIOD 3 ON	16:30	16:30	16:30	16:30
PERIOD 3 OFF	22:30	22:30	22:30	22:30

12.1.6 Reviewing the Programmes

Press **TIMER** button each time to toggle through the **ON** and **OFF** settings.

12.1.7 To Change the Programme

1. Press **TIMER** key repeatedly until the particular **ON** or **OFF** time appears.
2. Press **HOUR** button and **MINUTE** button to set new **ON** or **OFF** time.

12.1.8 Manual Select

1. Press **SELECT** to toggle through **ON / AUTO / OFF** modes as indicated by the timer status.

2. **ON** mode turns on the timer.

3. **OFF** mode turns off the timer.

4. **AUTO** mode runs the set programme.

12.1.9 Manual Select

This function is only applicable when your timer is set on **AUTO** mode.

You can temporarily override the normal switching times by pressing the ADV key. The temporarily override won't affect the normal programme after execution of the override.

1. Press **CH ADV** or **HW ADV** key the CH icon or HW icon will flash.

2. In approximately 5 seconds the display CH select mode 'AUTO' or HW select mode 'AUTO' will flash and go into the manual override function.

3. OFF mode turns off the timer.

4. To cancel override by pressing **CH ADV** or **HW ADV** and the 'AUTO' will stop flash.

12.1.10 Manual Hour

1. Press **CH ADV** or **HW ADV** key, the CH icon will flash.

2. You now have approx 5 second to enter desired length of time by pressing **CH ADV** or **HW ADV** key once for each hour the new time set should be in affect.

3. The MANUAL HOUR function will bring the unit ON 1 hour to 3 hours in the OFF mode.

4. The MANUAL HOUR function will bring the unit OFF 1 hour to 3 hours in the ON mode.

5. The MANUAL HOUR function is in operation, a count down clock will appear. Then normal display and count down clock will appear on the LCD alternately.

6. The MANUAL HOUR function will bring the unit ON 1 hour to 3 hours in off, clock will count down immediately.

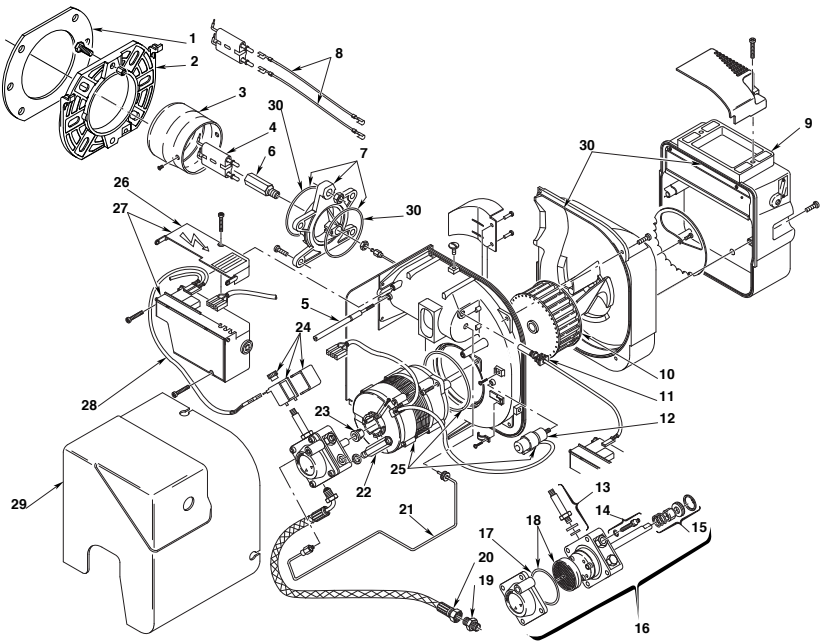
7. When MANUAL HOUR function will extend by 1 hour to 3 hours while ON, clock will count down after the programmed ON is finished.

12.1.11 Cancel Manual Hour Function

Press **CH ADV** or **HW ADV** button again the LCD display and switching status will return to normal.

13.0 Spares

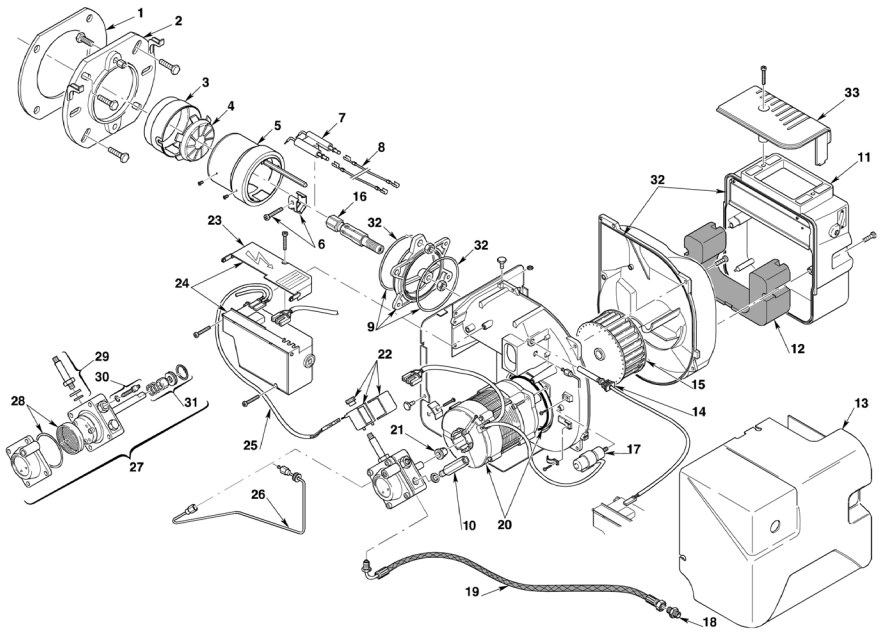
13.1 RDB 2.2 Spares



No	CODE	3514157	3514257	3514557	DESCRIPTION
1	3005787	•	•	•	Gasket
2	3006384	•	•	•	Flange
3	3020494	•			Cup-Shaped Head
3	3020258		•		Cup-Shaped Head
3	3020055			•	Cup-Shaped Head
4	3008860	•	•	•	Electrode Assembly
5	3008875	•	•	•	Screw
6	3008861	•	•	•	Nozzle Holder
7	3008862	•	•	•	Collar
8	3008794	•	•	•	High Voltage Lead
9	3008647	•	•		Air Damper Assembly
9	3008839			•	Air Damper Assembly
10	3005788	•	•	•	Fan
11	3008646	•	•	•	PE Cell
12	3002837	•	•	•	Capacitor 4.5µF
13	3007582	•	•	•	Needle Valve
14	3008651	•	•	•	Regulator

No	CODE	3514157	3514257	3514557	DESCRIPTION
15	3000439	•	•	•	Pump Seal
16	3020475	•	•	•	Pump
17	3007162	•	•	•	O-Ring
18	3008653	•	•	•	Filter O-Ring
19	3003602	•	•	•	Connector
20	3005720	•	•	•	Flexible Oil Line
21	3008644	•	•	•	Tube
22	3008876	•	•	•	Pressure Gauge
23	3000443	•	•	•	Joint
24	3008648	•	•	•	Coil-Shell & Knob
25	3002836	•	•	•	Motor & Capacitor
26	3008649	•	•	•	Protection
27	3008652	•	•	•	Control Box 535RSE/LD
28	3008851	•	•	•	Lead Coil
29	3008879	•	•	•	Cover
30	3008878	•	•	•	Kit Seals

13.2 RDB 3.2 Spares

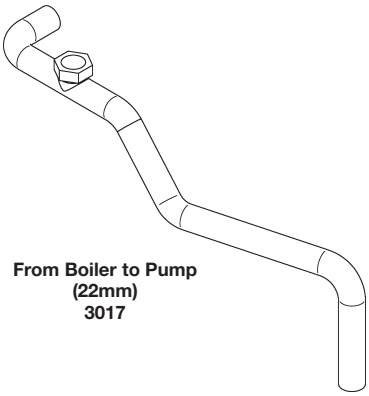


No	CODE	3748941	DESCRIPTION
1	3005795	•	Gasket
2	3008637	•	Flange
3	3005714	•	End Ring
4	3005713	•	Diffuser Disc
5	3007714	•	Blast Tube Assembly
6	3006552	•	Electrode Bracket
7	3007513	•	Electrode Assembly
8	3008794	•	High Voltage Lead
9	3008957	•	Collar
10	3008876	•	Pressure Gauge
11	3008839	•	Air Damper Assembly
12	3008958	•	Deadening
13	3008962	•	Cover
14	3008646	•	PE Cell
15	3005799	•	Fan
16	3008955	•	Nozzle Holder
17	3008960	•	Capacitor 5 µF

No	CODE	3748941	DESCRIPTION
18	3003602	•	Connector
19	3005720	•	Flexible Oil Line
20	3008964	•	Motor
21	3000443	•	Joint
22	3008648	•	Coil-Shell and Knob
23	3008649	•	Protection
24	3008652	•	Control Box 535SE/LD
25	3008851	•	Lead Coil
26	3008961	•	Tube
27	3020475	•	Pump
28	3008653	•	Filter - O-Ring
29	3007582	•	Needle Valve
30	3008651	•	Regulator
31	3000439	•	Pump Seal
32	3008963	•	Kit Seals
33	3008959	•	Air Intake

13.3 Pipe Spares

Utility Pumped & System Models -
UP70HE, UP90HE, UP120HE, US70HE, US90HE & US120HE

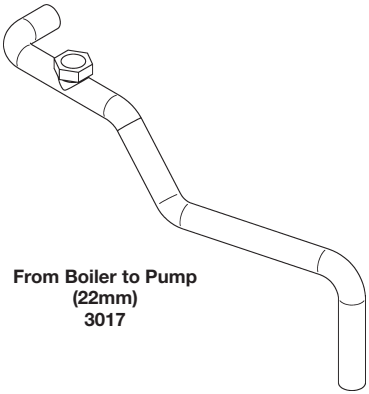


From Boiler to Pump
(22mm)
3017

Pump Flow Pipe
(22mm)
3015

Expansion Vessel
Pressure Hose
3020

Kabin Pak Pumped & System Models -
KP70HE, KP90HE, KP120HE, KS70HE, KS90HE & KS120HE

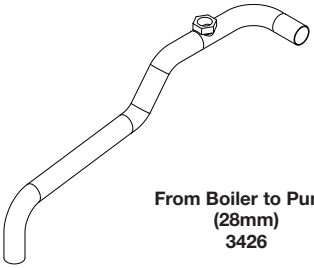


From Boiler to Pump
(22mm)
3017

Pump Flow Pipe
(22mm)
3015

Expansion Vessel
Pressure Hose
3020

150HE Pumped Models - UP150HE & KP150HE

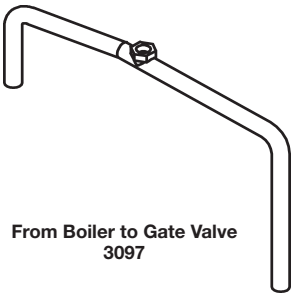


From Boiler to Pump
(28mm)
3426

Pump Flow Pipe
(28mm)
3425

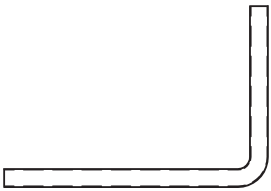
13.3 Pipe Spares cont'd

Utility and Kabin Pak Combi Models -
UC70HE, UC90HE, KC70HE & KC90HE

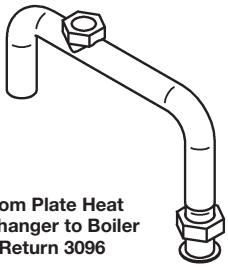


From Boiler to Gate Valve
3097

From Gate Valve to Pump
3098



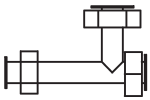
CH Flow from Pump
3100



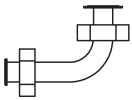
From Plate Heat Exchanger to Boiler Return 3096

Expansion Vessel Pressure Hose
3020

From Heat Store to Plate Heat Exchanger
1997

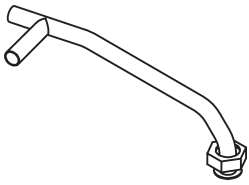


From Flowswitch to Mixing Valve & Plate Heat Exchanger
1992



From Plate Heat Exchanger to Mixing Valve
1994

DHW Flow from Mixing Valve
3101



From Strainer to Flowswitch & Filling Loop
3099

13.4 Short Parts List – Boiler

Part Description	Code
Flow Switch	1476
Tank & Boiler Control Thermostat	2131
Boiler Limit Thermostat (Combi Models)	281
Tank Limit Thermostat	2126
Pump Overrun Thermostat	3108
Plate Heat Exchanger	599
Twin Head Pump	2130
15/60 Pump (for replacement head)	602
3 Pole Relay	1827
Auto Air Vent C/W Check Valve	614
Pressure Relief Valve	2132
Filling Loop	2133
Pressure Gauge	3019
Mixer Valve	1621
PCB Controller MK4	2419
12 Litre Pressure Vessel	2128
Single Pole Relay & Base	3074
Dual-Safe Thermostat for Non-Combi Models	WDS2
Optional Programmer for Combi Models	PC1
Optional Programmer for Non-Combi Models	PU1

When ordering replacement casing panels it should be noted that due to the painting process there may be some variation in colour.

14.0 Your Guarantee, Terms & Conditions

1. Warmflow Guarantees

The boiler, including all controls, plate heat exchangers and associated equipment contained within the boiler casing, the burner and flue system if supplied by Warmflow against defective parts and faulty workmanship, for period of 12 months from the date of installation, providing the boiler is installed and commissioned in accordance with the installation instructions supplied with the boiler. The period of guarantee will be increased to 24 months in Great Britain providing:

- The guarantee registration form is fully completed and returned to Warmflow within 30 days from the date of installation, or 90 days from the date code stamped on the appliance.

- The boiler must be installed and commissioned by a Warmflow or other competent engineer, who is OFTEC registered. Commissioning of the boiler must be completed immediately after the boiler is installed.

- The boiler must be serviced by a Warmflow or other competent engineer, who is OFTEC registered, 12 months after the date of installation and thereafter, at 12 monthly intervals.

NOTE: In Northern Ireland and the Republic of Ireland the period of guarantee can only be increased to 24 months through the purchase of an extended warranty.

The water jacket and thermal store (in the case of a combination boiler) for a total of 5 years from the appliance date code, subject to the above conditions being complied with.

Warmflow reserves the right to repair or replace components within the guarantee period at a time and location that is most convenient to the company.

2. Conditions of Guarantee

The boiler must be installed, commissioned and serviced in accordance with the installation instructions supplied with the boiler.

Warmflow will accept no liability for the cost of repairs resulting from incorrect installation, inadequate commissioning, lack of regular maintenance, misuse, tampering or repair by unqualified persons.

All repairs must be authorised in writing by Warmflow prior to any work being carried out. Unauthorised claims are not covered by the guarantee.

Labour charges associated with the replacement of heat exchangers or thermal heat stores will be calculated on a sliding scale depending on the boiler output up to a set maximum. Contact Warmflow for current prices.

Faults and any associated costs occurring due to lack of fuel, power, water supply or scale formation are not covered by these guarantees.

Claims for consequential loss or damage are not covered by these guarantees.

In the event of a breakdown please contact your commissioning engineer who should then contact our service department whilst at your home, to report the fault.

The statutory rights of the customer are not affected by the guarantee.

NB: The nozzle supplied with the boiler is deemed to be an expendable item and is therefore excluded from the guarantee.

Commission/Service Record

Boiler Serial No |__|__|__|__|__|__|__|__|__|__|

In order that your boiler gives you many years of economical trouble free use and to validate the warranty, this boiler must be commissioned upon installation and serviced annually. Contact Warmflow for an approved engineer within your area.

COMMISSION

Date of Commission _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 1

Date of 1st Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 2

Date of 2nd Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 3

Date of 3rd Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 4

Date of 4th Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 5

Date of 5th Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 6

Date of 6th Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 7

Date of 7th Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 8

Date of 8th Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

SERVICE 9

Date of 9th Service _____
Company Name _____
Engineer Name _____
Engineer Signature _____
Telephone No _____

Notes

Notes

Notes

YOUR DETAILS

Mr/Ms/Mrs/Miss |__|__|__|__|

Initials |__|__|__|__|

Surname |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Home Telephone No (inc code) |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Mobile Telephone No |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Email Address |__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|

House Number/Name/Street |__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Town/City |__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|__|

County |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Postcode |__|__|__|__|__|__|__|__|__|

PRODUCT DETAILS

(found on warranty label located on the front or inside front of the appliance)

Appliance Type |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Serial Number |__|__|__|__|__|__|__|__|__|

Date of Installation |__|__|__|__|__|__|__|__|

NAME OF INSTALLER

Mr/Ms/Mrs/Miss |__|__|__|__|

Initials |__|__|__|__|__|

Surname |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Work Telephone No (inc code) |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Mobile Telephone No |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

NAME OF COMMISSIONING ENGINEER

Mr/Ms/Mrs/Miss |__|__|__|__|

Initials |__|__|__|__|__|

Surname |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Work Telephone No (inc code) |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Mobile Telephone No |__|__|__|__|__|__|__|__|__|__|__|__|__|__|

Your details will be used by Warmflow Engineering to provide customer services, information about extended warranties and for other marketing purposes. We will disclose your information to our service providers and agents for these purposes. Your details may also be used by other third parties for other marketing purposes. We and the third parties may contact you by mail, email or telephone. If you do not wish for us to use your data for other marketing purposes please put an X in this box ☐

To help keep your details accurate we may use information we receive from our partners. You can ask for a copy of your details (for a small fee) and to correct any inaccuracies. To make sure we follow your instructions correctly and to improve our service we may monitor or record our communications with you. Please note that failure to provide some or all of the information requested does not affect your statutory rights but may affect the quality of the service provided.

TEAR ALONG PERFORATION

BUSINESS REPLY SERVICE
Licence No BEL 1609

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CUSTOMERS FROM ROI
PLEASE AFFIX STAMP

Warmflow Engineering Ltd
Appliance Registration Dept
Lissue Industrial Estate
Moira Road
Lisburn
Co Antrim
BT28 2RF

WARMFLOW
The Boiler People

TEAR ALONG PERFORATION